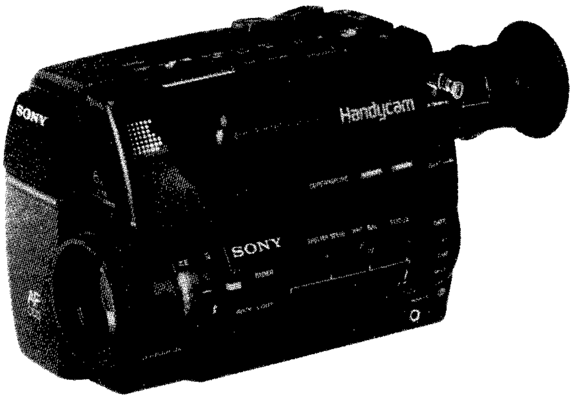
CCD-TR55E

SERVICE MANUAL

AEP Model
UK Model
Australian Model
E Model



Handycam

FL MECHANISM

MECHANICAL ADJUSTMENT
As to the mechanical adjustment and check and parts replacement, refer to the separate "8 mm Video Mechanical Adjustment Manual II FL mechanism (Q mechanism)".
Parts No. 9-972-705-11

SPECIFICATIONS

System

Video recording system	Rotary four heads, Helical scanning FM system
Audio recording system	Rotary head, FM system
Video signal	PAL colour, CCIR standards
Usable cassette	8 mm video format cassette
Tape speed	SP: Approx. 20.051 mm/sec. LP: Approx. 10.058 mm/sec.
Recording/Playback time	SP mode: 1 hour 30 min. (P5 – 90) LP mode: 3 hours (P5 – 90)
Fast forward/rewind time	Approx. 8 min. 30 sec. (P5 – 90)
Image device	CCD (Charge Coupled Device)
Viewfinder	Electronic viewfinder (black and white)
Lens	Combined 6 × power zoom lens f = 11 – 66 mm, F 2.0 with macro Filter diameter: 37 mm
Auto focus system	TTL
Colour temperature	AUTO: HOLD INDOOR 3,200K OUTDOOR 5,800K
Minimum illumination	5 lux (F 2.0)
Illumination range	5 lux–100,000 lux (0.5 – 9,290 footcandles)
Recommended illumination	More than 300 lux (28 footcandles)
Aperture correction	Automatic

– Continued on next page –

MICROFILM

8 VIDEO CAMERA RECORDER

SONY®

Input and output connector

AEP, UK MODEL

Video output	Phono jack, 1 Vp-p, 75 ohms unbalanced sync negative
Audio output	Phono jack, −7.5 dBs, (at output impedance 47 kilohms) impedance less than 2.2 kilohms

Australian, E MODEL

Video input/output	Phono jack, 1 Vp-p, 75 ohms unbalanced sync negative
Audio input/output	input: Phono jack, −7.5 dBs, input impedance more than 47 kilohms output: −7.5 dBs, (at output impedance 47 kilohms) impedance less than 2.2 kilohms

RFU DC OUT	Special minijack, DC 5 V
Earphone jack	Minijack, 8-ohm impedance
Remote jack	Stereo mini-minijack
MIC jack	Minijack, −66 dBs, low impedance with 2.5−3 V DC output, impedance 6.8 kilohms

Display in the viewfinder

Mode: STBY/REC
Caution: 🪫 / 💧 / 📼 / ⊗ / ⏏
DATE/TIME, FOCUS, WHITE BALANCE,
ZERO MEM, FADER, ▨
title colour, title mode,
title scroll mode, title reverse mode,
tape counter, auto focus frame, shutter speed,
recording/battery lamp

General

Power requirements	On battery mounting surface 6.0 V (battery pack) 7.5 V (AC power adaptor) 9.0 V (alkaline batteries)
Power consumption	5.2 W (camera recording) including the viewfinder
Installation	Vertically, horizontally
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	−20°C to +60°C (−4°F to +140°F)
Dimensions	Approx. 106 × 107 × 176 mm (w/h/d) (4$^1/_4$ × 4$^1/_4$ × 7 in.)
Weight	Approx. 790 g (1 lb 12 oz) excluding the battery and cassette
Microphone	Electret condenser microphone, omni-directional monaural type

Design and specifications are subject to change without notice.

Note

This appliance conforms with EEC Directives 76/889 and 82/499 regarding interference suppression.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

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The color reproduction standard frame is contained after the adjustment element location of camera adjustment parts

SERVICE NOTE

[HEAD CLEANING]

After an extended period of use the video image may become indistinct or may not appear at all during playback of a tape. The cause of this usually are dirty video heads. For remedy, cleaning of the heads is required.

Check for Head Clogs During Recording

① Use a blank tape, record a short section, then press the stop button to stop.
② Set to recording mode again.
③ If the [⊗] mark is flashing in the viewfinder at this time, head clogs are occurred.

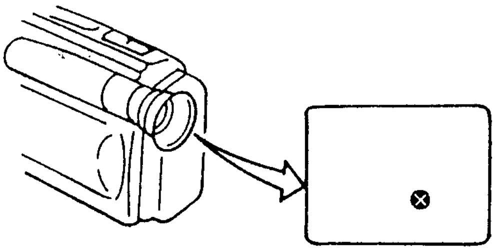
Check During Playback of a Tape

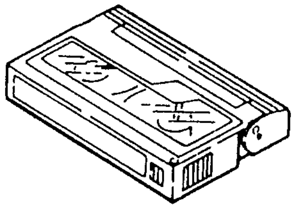
① Play back a pre-recorded tape and display the image on a TV screen.
② If there is no sound and the image is unstable, no image appears on the screen, or tape transport is unstable, head clogs are occurred.

Remedy

[Cleaning method using a cleaning tape]

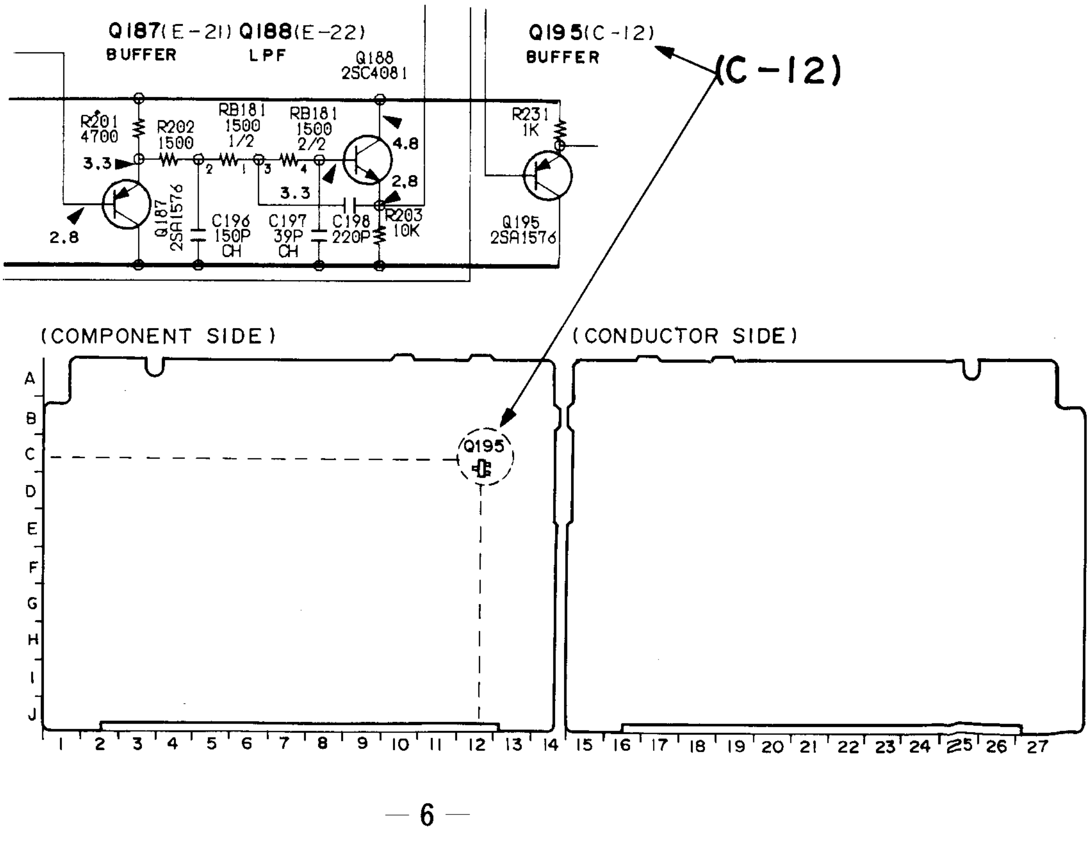
- Use the Cleaning Tape V8-6CLH. (Please follow the instructions attached to the cleaning tape.)





[SEMICONDUCTOR LOCATION]

In this service manual, the mounted locations of the semiconductors (IC, transistor, diodes) are indicated in red sa shown below. This enables to find the location on the board easily when servicing.


Q187(E-21) Q188(E-22)
BUFFER
LPF
Q188
2SC4081
Q195(C-12)
BUFFER
(C-12)
R201
4700
R202
1500
RB181
1500
1/2
RB181
1500
2/2
4.8
2.8
3.3
3.3
2.8
Q187
2SA1576
C196
150P
CH
C197
39P
CH
C198
220P
R203
10K
R231
1K
Q195
2SA1576
(COMPONENT SIDE)
(CONDUCTOR SIDE)
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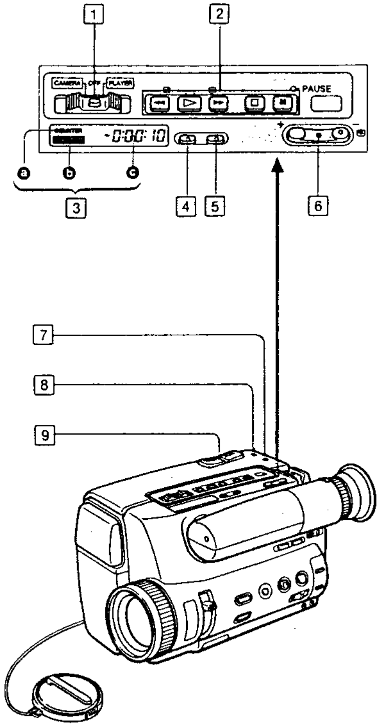
SECTION 1
GENERAL

This section is extracted from instruction manual.

Identifying the Basic Parts

A-1 (AEP, UK)



For details on the use of each control, refer to the pages indicated in the circle:

A-1

1 **POWER switch**
CAMERA: For camera recording
PLAYER: For playing back or editing tapes
OFF: Power off

2 **Tape transport buttons and PAUSE indicator**
▷ (playback)
►► FF (fast forward)
◄◄ REW (rewind)
□ (stop)
❚❚ (pause)
During pause mode the indicator lights.

3 **Display window**
ⓐ COUNTER indicator
ⓑ ZERO MEM (memory) indicator
ⓒ Indicates the time, date or the tape counter

4 **Counter RESET button**
Press to reset the counter to zero.

5 **ZERO MEM (zero memory) button**
Used to memorize the counter zero point.

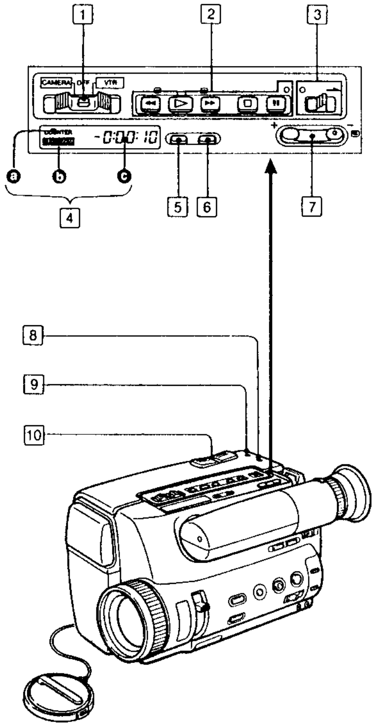
6 **EDITSEARCH ⊜ button**

7 **Emergency lamp**
Blinks when an emergency has happened.

8 **DEW lamp**
Blinks when moisture has condensed inside the unit.

9 **Power zoom button**

A-1 (Australian, E)



A-1

1 **POWER switch**
CAMERA: For camera recording
VTR: For playing back or editing tapes (Australian, E)
OFF: Power off

2 **Tape transport buttons and pause indicator**
▷ (playback)
►► FF (fast forward)
◄◄ REW (rewind)
□ (stop)
❚❚ (pause)
During pause mode the indicator lights.

3 **● REC (recording) switch and recording indicator**
Slide in the direction of the arrow for recording. During recording the indicator lights.

4 **Display window**
ⓐ COUNTER indicator
ⓑ ZERO MEM (memory) indicator
ⓒ Indicates the time, date or the tape counter

5 **COUNTER RESET button**
Press to reset the counter to zero.

6 **ZERO MEM (zero memory) button**
Used to memorize the counter zero point.

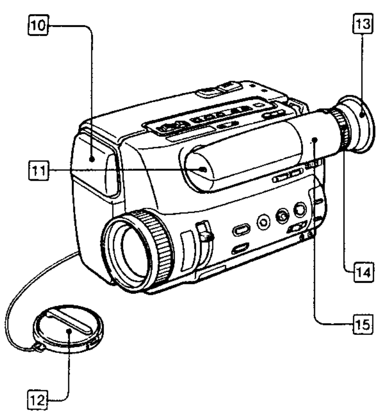
7 **EDITSEARCH ⊜ button**

8 **Emergency lamp**
Blinks when an emergency has happened.

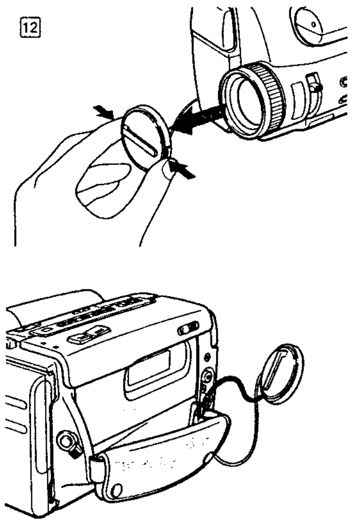
9 **DEW lamp**
Blinks when moisture has condensed inside the unit.

10 **Power zoom button**

A-2 **(AEP, UK)**



A-3



A-2

10 **Built-in microphone (monaural)**

11 **Camera recording/battery lamp**
Lights during camera recording. It blinks when the battery is exhausted.

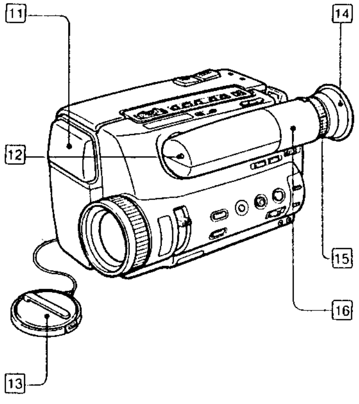
12 **Lens cap**
To remove the lens cap, squeeze the sides in as shown. Hook it on the grip strap so it won't be lost. A-3

13 **Eyecup**

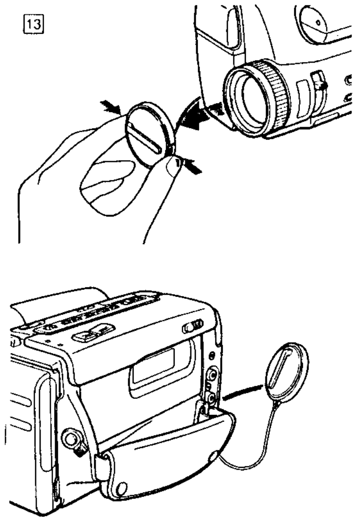
14 **Viewfinder lens adjustment ring**
Adjust to your eyesight to assure good focus. Be sure to adjust this ring when shooting for the first time.

15 **Viewfinder**
The picture being recorded or played back can be monitored in monochrome here. Also, data such as caution indicators and function mode are displayed on the viewfinder screen.

A-2 **(Australian, E)**



A-3



A-2

11 **Built-in microphone (monaural)**

12 **Camera recording/battery lamp**
Lights during camera recording. It blinks when the battery is exhausted.

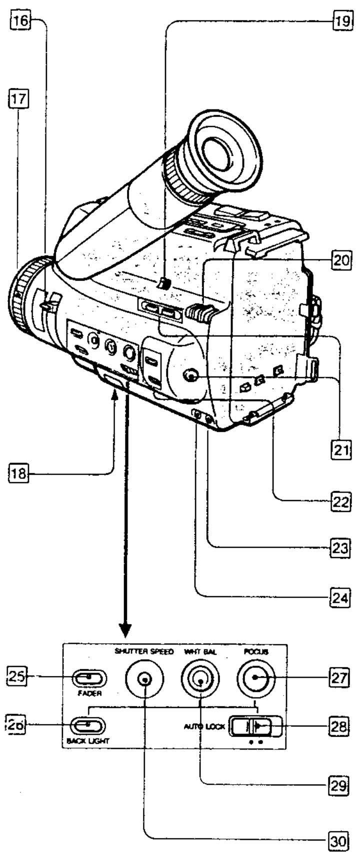
13 **Lens cap**
To remove the lens cap, squeeze the sides in as shown. Hook it on the grip strap so it won't be lost. A-3

14 **Eyecup**

15 **Viewfinder lens adjustment ring**
Adjust to your eyesight to assure good focus. Be sure to adjust this ring when shooting for the first time.

16 **Viewfinder**
The picture being recorded or played back can be monitored in monochrome here. Also, data such as caution indicators and function mode are displayed on the viewfinder screen.

A-4 (AEP, UK)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SHUTTER SPEED
WHT BAL
FOCUS
FADER
BACK LIGHT
AUTO LOCK

A-4

16 **Zoom lever**
Macro set button

17 **Focus ring**

18 **Lithium battery compartment**

19 **Recording mode/EDIT switch**
Switch it depending on the operating mode.

Mode	Recording	Playback	Editing
Setting	SP LP	EDIT	EDIT
Function	Recording mode switch	EDIT switch	

20 **BATT (battery eject) knob**

21 **Superimpose buttons**
MEMORY button
COLOR/MODE button
SUPERIMPOSE button

22 **DATE and TIME buttons**
Press to display or turn off the date or time.

23 **🎧 (earphone) jack (minijack)**

24 **REMOTE jack (stereo mini-minijack)**

25 **FADER button**

26 **BACK LIGHT button**

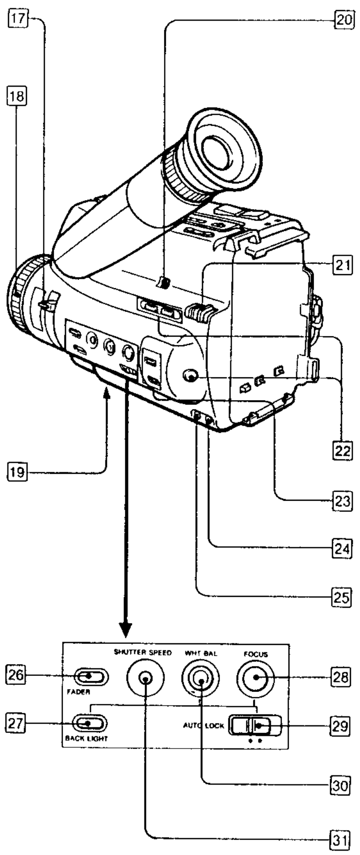
27 **FOCUS button**
Used for manual focusing.

28 **AUTO LOCK switch**
Normally set to the left AUTO LOCK position (green position).

29 **WHT BAL (white balance) button**

30 **SHUTTER SPEED button**
Used to select the shutter speed.

A-4 (Australian, E)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31
SHUTTER SPEED
WHT BAL
FOCUS
FADER
BACK LIGHT
AUTO LOCK

A-4

17 **Zoom lever**
Macro set button

18 **Focus ring**

19 **Lithium battery compartment**

20 **EDIT switch**
Normally set it to the left position. When editing tapes, set to EDIT.

21 **BATT (battery eject) knob**

22 **Superimpose buttons**
MEMORY button
COLOR/MODE button
SUPERIMPOSE button

23 **DATE and TIME buttons**
Press to display or turn off the date or time.

24 **🎧 (earphone) jack (minijack)**

25 **REMOTE jack (stereo mini-minijack)**

26 **FADER button**

27 **BACK LIGHT button**

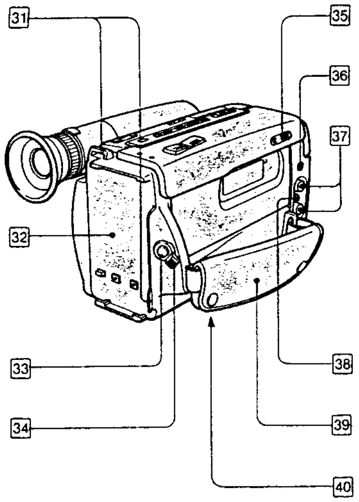
28 **FOCUS button**
Used for manual focusing.

29 **AUTO LOCK switch**
Normally set to the left AUTO LOCK position (green position).

30 **WHITE BAL (white balance) buton**

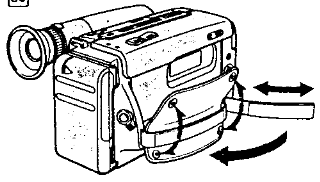
31 **SHUTTER SPEED button**
Used to select the shutter speed.

A-5 (AEP, UK)



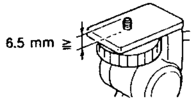
A-6

39



A-7

40



A-5

31 **Hooks for shoulder strap**
Attach a shoulder strap.

32 **Battery mounting surface**

33 **START/STOP button**
Press to start and stop camera recording.

34 **STANDBY switch**
Turn it to STANDBY to set the unit to recording pause mode.

35 **Lid lock**
Slide in the arrow direction to open the cover.

36 **MIC jack (PLUG IN POWER)**
Connect an external microphone.
The MIC jack accepts Sony "plug-in-power" microphones and supplies power to them.

37 **VIDEO/AUDIO OUTPUT jacks (phono jacks)**

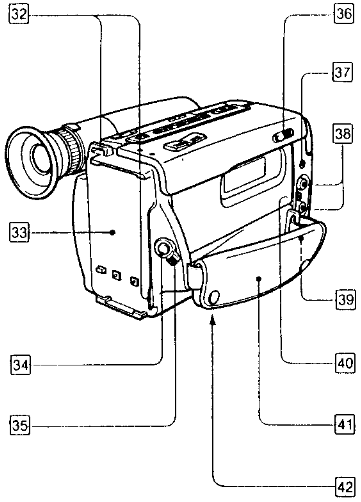
38 **RFU DC OUT (RFU adaptor DC output) jack (special minijack)**
Supplies power to the RFU-89EA RFU adaptor.

39 **Grip strap**
Adjust the length so that your thumb can easily manipulate the START/STOP button. A-6

40 **Tripod receptacle**

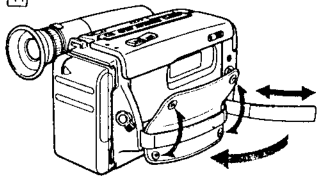
Note when attaching a tripod not manufactured by Sony
When attaching a tripod not manufactured by Sony, the length of the camera mounting screw must be less than 6.5 mm.
Otherwise the screw may damage the inner parts of the camera. A-7

A-5 (Australian, E)



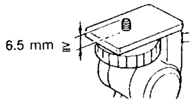
A-6

41



A-7

42



A-5

32 **Hooks for shoulder strap**
Attach a shoulder strap.

33 **Battery mounting surface**

34 **START/STOP button**
Press to start and stop camera recording.

35 **STANDBY switch**
Switch it to STANDBY to set the unit to recording pause mode.

36 **Lid lock**
Slide in the arrow direction to open the cover.

37 **MIC jack (PLUG IN POWER)**
Connect an external microphone.
The MIC jack accepts Sony "plug-in-power" microphones and supplies power to them.

38 **VIDEO/AUDIO INPUT/OUTPUT jacks (phono jacks)**

39 **INPUT/OUTPUT selector switch**
For INPUT → Slide to INPUT
For OUTPUT → Slide to OUTPUT

40 **RFU DC OUT (RFU adaptor DC output) jack (special minijack)**
Supplies power to the RFU-89UCA RFU adaptor

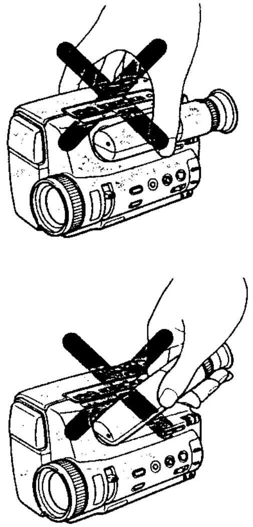
41 **Grip strap**
Adjust the length so that your thumb can easily manipulate the START/STOP button. A-6

42 **Tripod receptacle**

Note when attaching a tripod not manufactured by Sony
When attaching a tripod not manufactured by Sony, the length of the camera mounting screw must be less than 6.5 mm.
Otherwise the screw may damage the inner parts of the camera. A-7

Caution A-8
Do not pick up the unit as shown in the illustrations.

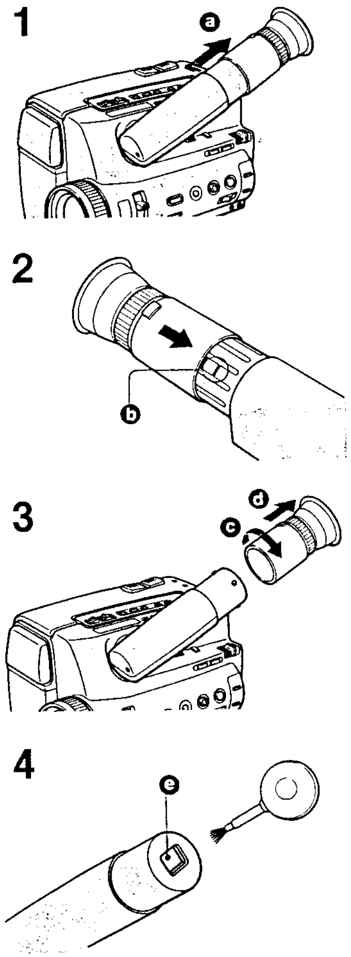
A-8



To remove dust from inside the viewfinder A-9
Follow the numbered order and note ⓐ to ⓔ.

ⓐ Pull out until it stops.
ⓑ Push in to align the end of the tube with the mark.
ⓒ Turn counterclockwise until it stops.
ⓓ Pull off.
ⓔ Clean the surface of the viewfinder screen with a blower.

A-9



Power Sources

Selection of Power Sources

This manual shows the operations on one of the following power sources.

Place		Power source	Accessory to be used
	Indoors	House current	AC power adaptor AC-V30 or AC-V55 (page 13)
	Outdoors	Battery pack	Battery pack NP-55, large capacity NP-77, etc. (page 11) Battery case EBP-55 or EBP-77 (page 12)
	In the car	12 V or 24 V car battery	DC pack DCP-55 (page 13) (DCC-16B car battery cord supplied)

Notes on power source

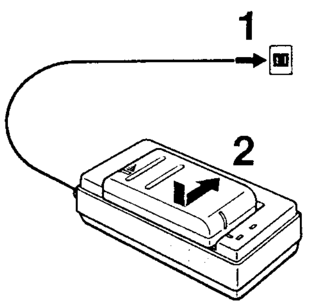
- Disconnecting the power source or removing the battery pack during recording or playback may damage the inserted cassette tape. If this is done by accident, supply the power again immediately and turn on the power switch.
- Be careful not to let any metal object touched on the metal part on the battery pack or AC power adaptor. When the battery pack is not to be used, keep it in its case.

Optional Accessories for Charging

- **AC-V55 AC power adaptor**
  Two battery packs can be charged simultaneously.
- **BCA-70 or BCA-80 battery charge adaptor, ACP-88 AC pack and NPA-55 battery adaptor**
  For charging, insert an NP-55 into the NPA-55.

Battery Pack — NP-55 or large capacity NP-77

B-1

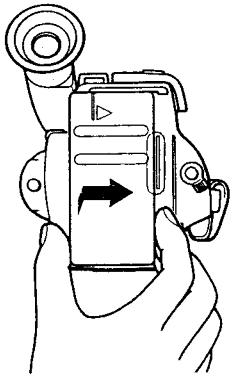


First, charge the battery pack. B-1
Use the AC-V30 AC power adaptor.
The charging time is about 1 hour for an NP-55 battery pack, or about 2 hours for an NP-77 battery pack.

1 **Connect the AC-V30 to a wall outlet.**

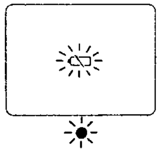
2 **Attach the battery pack to the AC-V30.**
Align the grooves on the battery pack with those on the AC-V30, and while pressing the battery pack, slide it as illustrated.

B-2



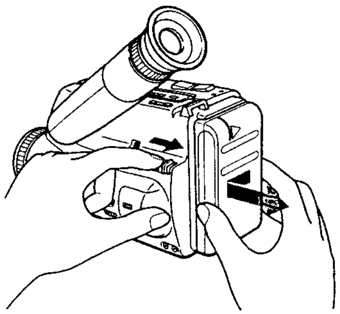
To attach the battery pack to the video camera recorder B-2
Lift up the viewfinder.
Align the right side of the battery pack with the line on the recorder, and while pressing the battery pack, slide it to the right.
Make sure that the battery is fitted completely to the mounting surface. Imperfect fit may damage the projections on the recorder.

B-3

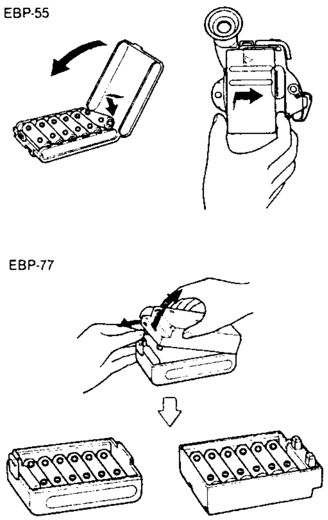


When the battery becomes weak B-3
The ⌫ indication and red lamp blink rapidly in the viewfinder. Replace the battery pack with the fully charged one.

B-4



B-5



To remove the battery pack B-4
While pressing the BATT knob in the arrow direction, slide to the left and pull out the battery pack as illustrated.

Battery life
A fully-charged NP-55 battery pack provides approximately 60 minutes of continuous camera recording, and an NP-77 provides approximately 120 minutes of continuous camera recording.

Notes
- The video camera recorder consumes power even in the recording pause mode. When recording short scenes using the recording pause mode, the battery life is less than half that of continuous recording.
  When recording is not to be started soon, turn off the power with the STANDBY switch.
- If the battery pack is not fully charged or if it is used in a cold place, its operating time is also shortened.
- If the contacts of the unit and the battery pack are dirty, this makes the battery life shorten.

When the video camera recorder is not in use, remove the battery pack.
If the battery is installed, even if the POWER switch is set to OFF, a very small amount of electric current flows.

Battery Case EBP-55 B-5

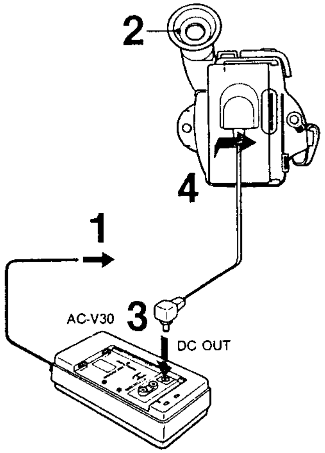
1 **Insert the six R6 (size AA) alkaline batteries into the battery case.**
EBP-55: 6 batteries
EBP-77: 12 batteries

2 **Connect and remove the case in the same way as the battery pack.**

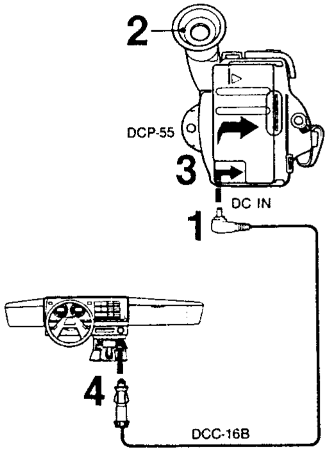
Battery life
EBP-55: Approximately 60 min.
EBP-77: Approximately 180 min.
(with new batteries, continuous recording, indoors)

Notes
- When batteries become weak, the ⌧ indication may not blink. If the cassette holder does not open, replace new batteries.
- In a cold place, the case can not work.
- Lift the viewfinder when attaching the battery case.

B-6



B-7



House Current — Using AC Power Adaptor B-6

1 **Connect the AC power adaptor to a wall outlet.**

2 **Lift up the viewfinder.**

3 **Insert the connecting cord supplied with the AC-V30 AC power adaptor into the DC OUT jack on the AC power adaptor.**

4 **Align the right side of the connecting plate with the line on the recorder, and while pressing the connecting plate, slide it to the right.**

To remove the connecting plate for the AC power adaptor from the video camera recorder
While pressing the BATT knob on the recorder, slide and pull out the connecting plate.

The optional AC-V55 AC power adaptor can also be used to operate this recorder on house current.

Car Battery — Using the DC Pack B-7

1 **Insert the DCC-16B car battery cord supplied with the DCP-55 DC pack into the DC IN jack on the DC pack.**

2 **Lift up the viewfinder.**

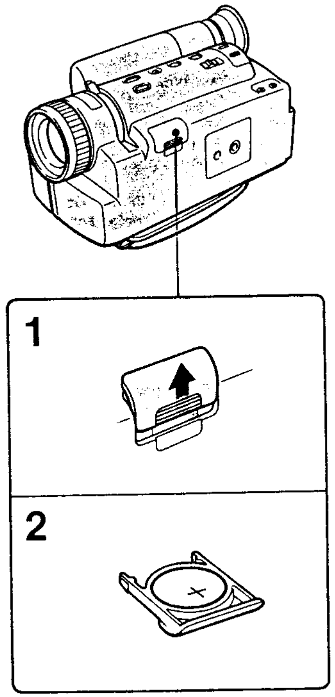
3 **Align the right side of the DC pack with the line on the recorder, and while pressing the DC pack, slide it to the right.**

4 **Connect the DCC-16B car battery cord to the cigarette lighter socket of a car (12 V or 24 V).**

To remove the DC pack from the video camera recorder
While pressing the BATT knob on the recorder, slide and pull out the DC pack.

The optional AC-V55 AC power adaptor and the DCC-16AE car battery cord can also be used to operate this recorder on a 12V or 24V car battery.

B-8



Power Sources

Lithium Battery

Why the unit needs a lithium battery
This unit uses a lithium battery to activate the clock and to keep a title in the memory.
Before operating the unit for the first time, install the supplied lithium battery. B-8

1 **To remove the lid of the lithium-battery compartment, slide it in the direction of the arrow.**

2 **Install the supplied CR2025 lithium battery with the ⊕ side facing out.**

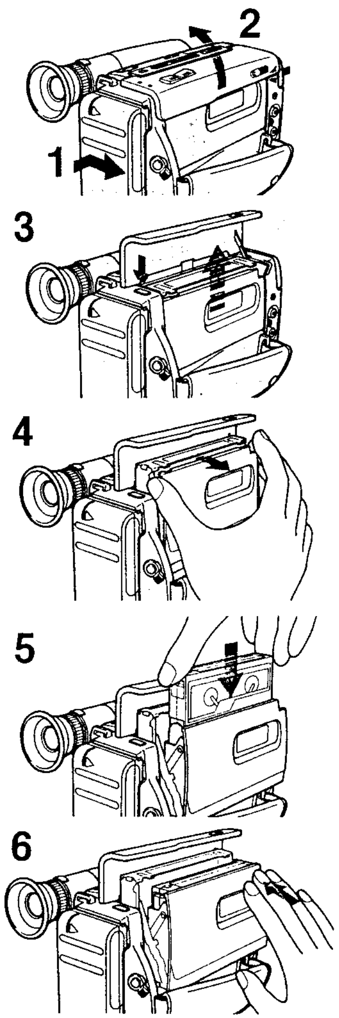
3 **Replace the lid.**

Lithium battery life
Approximately 1 year in normal operation.
When the lithium battery becomes weak, the time indication will blink on the viewfinder screen for about 5 seconds.
In this case, replace the battery with a Sony CR2025 lithium battery. Use of another battery may present a risk of fire or explosion.
After replacing the battery, readjust the date and time and titles. (If the battery is replaced with the battery pack attached, the readjustments are not necessary.)

Notes on lithium battery

- Keep the lithium battery out of the reach of children.
  Should the battery be swallowed, immediately consult a doctor.
- Wipe the battery with a dry cloth to assure a good contact.
- Be sure to observe the correct polarity when installing the battery.
- Do not hold the battery with metallic tweezers, otherwise a short-circuit may occur.
- Do not break up the battery nor throw it into a fire, which might cause it to explode. Carefully dispose of the used batteries.

C-1



Cassette Care

Cassette Insertion C-1

1 **Connect a power source.**

2 **While sliding the lid lock in the direction of the arrow and lift up the lid until it clicks.**

3 **Press the EJECT button.**
The lip of the cassette compartment will lift up.

4 **Gently pull the cassette compartment cover toward you.**
Do not force it.

5 **Insert the cassette with the window facing out.**

6 **Press the PUSH mark on the cassette compartment cover to close it.**

7 **Close the lid.**

Cassette Ejection

1 **Make sure that a power source is connected.**

2 **While sliding the lid lock in the direction of the arrow and lift the lid up until it clicks.**

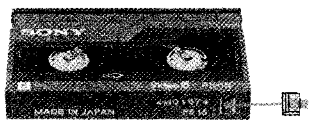
3 **Press the EJECT button.**
The lip of the cassette compartment will lift up.

4 **Gently pull the cassette compartment cover toward you.**
Do not force it.

5 **Take the cassette out and press the PUSH mark on the compartment to close it.**

6 **Close the lid.**

C-2



Cassette Care

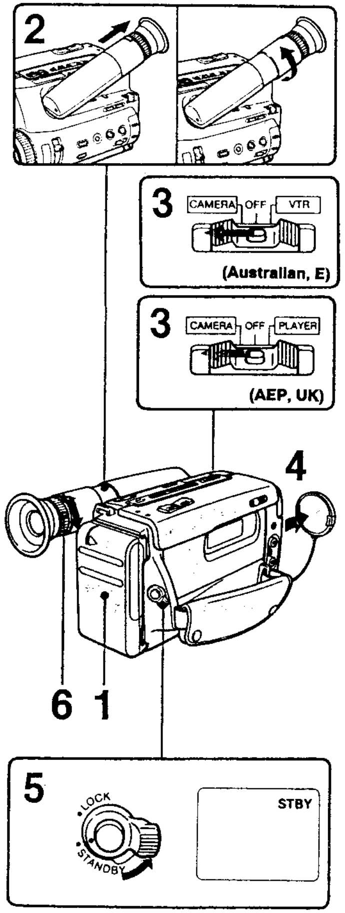
To Prevent Accidental Erasure C-2

Slide out the tab on the cassette so that it covers the opening. (A red mark will appear.)

To re-record on the cassette, slide the tab in to uncover the opening.

Notes
- Don't press the lip of the cassette compartment forcibly when it is moving.
  When the cassette compartment cover is pressed to close, the lip of the cassette compartment will automatically lower.
- Never insert anything in the small holes on the rear of the cassette. These holes are used to sense the kind of tape, thickness of tape, or if the tab is out or in, etc.
- To record from the beginning of the tape, run the video camera recorder for about 15 seconds at the beginning of a cassette before recording. It will avoid missing the starting point during playback on a video cassette recorder.

D



Camera Operation

Adjustment of the Position of the Viewfinder Lens

The position of the viewfinder lens for optimum vision varies depending on the user. D

1 **Connect a power source.**

2 **Set the viewfinder.**
Pull the viewfinder out and turn it clockwise until it clicks.

3 **While pressing the small button, set the POWER switch to CAMERA.**

4 **Remove the lens cap.**

5 **Turn the STANDBY switch to STANDBY.**

6 **Turn the viewfinder lens adjustment ring so that the indicator displayed on the viewfinder screen comes into sharp focus.**

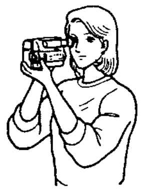
Adjustment of the position of the viewfinder lens is necessary only for your initial use, or for use after someone else.

Notes
- **If you leave the unit in the recording pause mode for 5 minutes or more, the unit will be automatically turned off. To resume recording pause mode, turn the STANDBY switch to LOCK once and turn it to STANDBY again.**
- For "once-only" events, it is strongly recommended to have a trial run to check that everything is working perfectly.

Easy Camera Recording with Automatic Adjustment

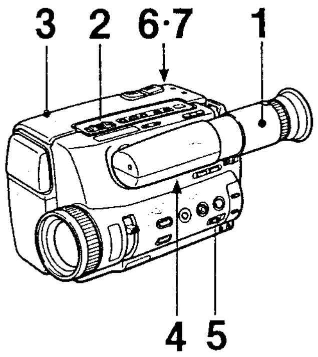
How to Record

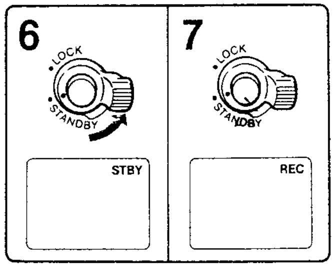
E-1



Hold the camera recorder as in the illustration. if your nose touches the recorder, adjust the angle of the viewfinder. E-1

E-2 **(AEP, UK)**





E-2

1 **Make sure that the viewfinder is correctly set.** (page 17).

2 **While pressing the small button, set the POWER switch to CAMERA.**

3 **Insert the cassette.** (page 15)

4 **Set the recording mode/EDIT switch to LP or SP, according to the length of the programme to be recorded.**

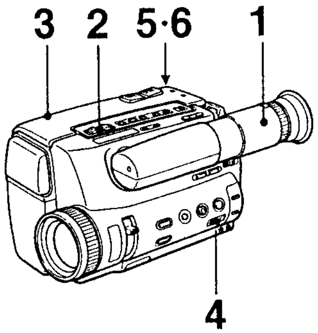
5 **Set the AUTO LOCK switch to left AUTO LOCK position. (green position)**

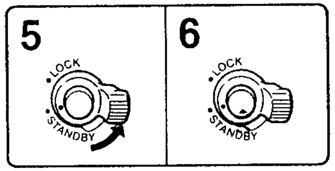
6 **Turn the STANDBY switch to STANDBY.**
The unit will enter the recording pause mode.
STBY is displayed in the viewfinder during recording pause mode.

7 **Press the START/STOP button.**
Recording will start.
REC is displayed in the viewfinder during recording.

To stop recording, press the START/STOP button.
The unit will enter the recording pause mode. Avoid rough handling or mechanical shock to the unit. A smooth transition between scenes may not be made.

E-2 **(Australian, E)**





E-2

1 **Make sure that the viewfinder is correctly set.** (page 34).

2 **While pressing the small button, set the POWER switch to CAMERA.**

3 **Insert the cassette.**

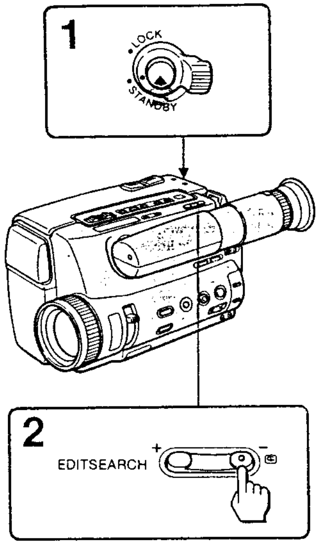
4 **Set the AUTO LOCK switch to left AUTO LOCK position. (green position)**

5 **Switch the STANDBY switch to STANDBY.**
The unit will enter the recording pause mode.
STBY: Displayed in the viewfinder during recording pause mode.

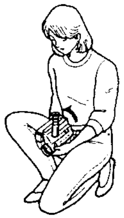
6 **Press the START/STOP button.**
Recording will start.
REC: Displayed in the viewfinder during recording.

To stop recording, press the START/STOP button.
The unit will enter the recording pause mode. Avoid rough handling or mechanical shock to the unit. A smooth transition between scenes may not be made.

E-3



E-4



Easy Camera Recording with Automatic Adjustment

E-3

To check the last portion of the previous recording

1 **Set the recorder in recording pause mode by pressing the START/STOP button.**

2 **Press the ⊜ side of the EDITSEARCH button momentarily.**

The last few seconds of the recorded portion are rewound and then the recorded picture is monitored on the viewfinder screen. The unit then enters the recording pause mode.

Note
If the picture has not been recorded
The video head may be contaminated. Clean the heads using the Sony V8-25CLH video head cleaning cassette.

After using
Turn the STANDBY switch to LOCK and set the POWER switch to OFF. (You need not press the center button when setting the switch to OFF.) And put back the viewfinder.

For low position recording E-4
The viewfinder can be turned up 90 degrees. It can be used in either the pushed-down or pulled-out condition.

1 **Turn the STANDBY switch to STANDBY.**

2 **Press the START/STOP button.**

Easy Camera Recording with Automatic Adjustment

Note on power source
If the POWER switch is moved during recording, the tape will stop.

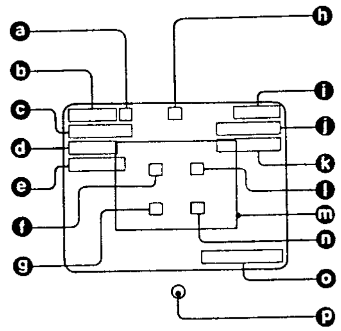
Notes on light sources
- Should you shoot a subject in bright conditions such as sunlight just after shooting in a dark place, the picture may not appear on the viewfinder screen. In this case, move the camera away from the subject to resume the normal condition.
- A vertical band may appear when a subject such as a candle flame or a light is shot against a dark background.

Notes on playback on another VCR
- To view the picture which has been recorded on this unit, set the monitor switch of the recorder for playback to the STD (standard) position.
- When recording on this unit using a tape on which PCM stereo sound has previously been recorded, set the monitor switch of the video cassette recorder for playback to the STD (standard) position. Otherwise, the sound may not be heard or may be distorted.

Notes on automatic adjustment
- During recording with auto focusing, do not turn or stop the focus ring forcibly.
- Keep the lens clean.

The camera recording with automatic adjustment may not produce optimum results under certain conditions. In this case, manually adjust the focus, white balance and iris. See pages 27, 30 and 34.

E-5



Easy Camera Recording with Automatic Adjustment

Indications inside the Viewfinder and in the Display Window

Inside the viewfinder E-5

ⓐ ▣
The indication lights while the BACK LIGHT button has been pressed.

ⓑ ☀, ☼ **HOLD**
White balance mode (page 31)

ⓒ **Title mode and colour** (page 41)

ⓓ **Shutter speed**

ⓔ **FADER**
The indication lights while the FADER button has been pressed.

ⓕ ▭
The indication blinks slowly when the battery is weak and blinks rapidly when the battery is exhausted.

ⓖ ▣
The indication blinks when moisture condensed inside the unit.

ⓗ ■
The indication lights while manual focusing. The indication blinks while auto focus function does not operate correctly.

ⓘ **Tape transport mode**

ⓙ **Tape counter**

ⓚ **ZERO MEM**
The indication blinks when the ZERO MEM button is pressed.

ⓛ ▭
The indication blinks slowly when the tape is out or close to the end. The indication blinks rapidly when the tape is at its end.

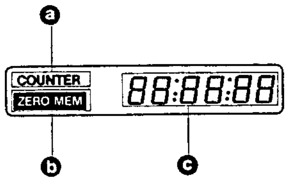
ⓜ **Auto focus frame**
This frame appears during auto focus recording.

ⓝ ⊗/⏏
The indication blinks when the unit cannot function normally.
The indication blinks when the gap of the head is clogged.
Clean the heads using the video head cleaning cassette.

ⓞ **Date or Time**

ⓟ **Camera recording/battery lamp**
The indication lights during camera recording.
It blinks when the battery is weak.

E-6



Easy Camera Recording with Automatic Adjustment

In the display window E-6
ⓐ COUNTER indicator
ⓑ ZERO MEM (memory)
ⓒ Time or tape counter

Function of the AUTO LOCK Switch

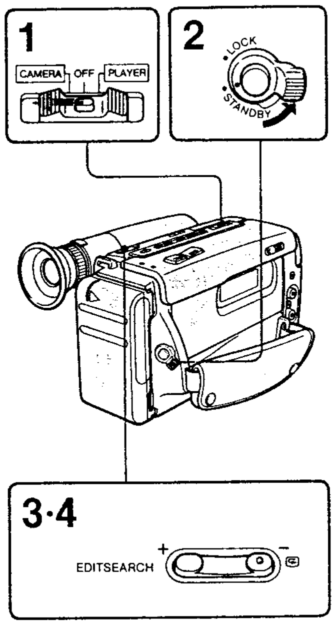
When the AUTO LOCK switch is set to AUTO LOCK (green position), the white balance, shutter speed (1/50 normal speed), and focus are adjusted automatically. The back light function does not work. But under certain circumstances, manual adjustment is better for effective recording.

When the AUTO LOCK switch is set to the right position (white position), each manual function works as follows.

Each push of the button cyclically changes each function and the indication on the viewfinder changes.	
WHITE BALANCE See page 30.	No indication → HOLD → ☀ → ☼ (Auto)
SHUTTER SPEED See page 32.	No indication → 120 → 250 → 1000 → 2000 → 4000 (1/50) (1/120) (1/250) (1/1000) (1/2000) (1/4000)
FOCUS See page 27.	AF frame → ■ (Manual)
BACK LIGHT See page 34.	No indication → ▣

Notes
- Just after the battery pack is attached to the recorder, even if the AUTO LOCK switch is set to the right position, the AUTO LOCK function will work.
- If the AUTO LOCK switch is set to AUTO LOCK after each function is adjusted manually, and then set to the right position again, the previous manual setting will be recalled.

E-7



Instant Playback on the Spot E-7

You can monitor the picture just recorded on the viewfinder screen.

1 **While pressing the small button, set the POWER switch to CAMERA.**

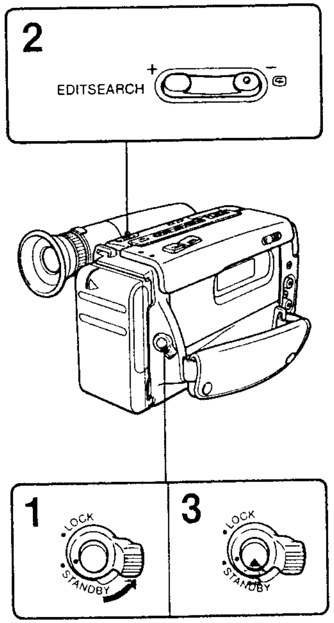
2 **Turn the STANDBY switch to STANDBY.**

3 **Keep pressing the "−" side of the EDITSEARCH button to reverse the picture.**

4 **Keep pressing the "+" side of the EDITSEARCH button to view the playback picture.**

Note
While monitoring the picture in the viewfinder screen, the sound will not be heard.

E-8



During Recording, to Record Again on the Previous Recorded Portion E-8

Normally, smooth recording can be made even if the recording is stopped and started again, or even if the power is turned off and on again, provided that the cassette is not removed. But, if the cassette has been removed, proceed as below.

1 **Turn the STANDBY switch to STANDBY.**

2 **Locate the point from which the recording is to begin again by monitoring the picture on the viewfinder screen.**
Keep pressing the "+" side of the EDITSEARCH button to advance the picture at a normal playback speed, or the "−" side to reverse the picture.

Release the EDITSEARCH button at the desired point.
The unit will be set to recording pause mode.

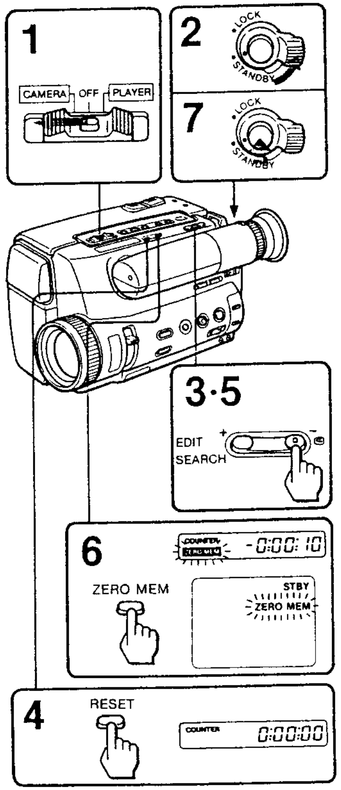
3 **Set the START/STOP button to start recording.**

To monitor the sound while viewing the playback picture on the viewfinder screen
Connect an earphone to the 🎧 jack.
1 While pressing the small button, set the POWER switch to PLAYER.
2 Press the ◀◀ button to rewind the tape.
3 Press the □ button to stop the tape.
4 Press the ▷ button to start playback.

To stop the playback, press the □ button.

F-1

F-2



Insert Recording 1

— Using EDITSEARCH button

F-1

You can insert (record) video and audio simultaneously from the camera onto any recorded tape.

Operation F-2

When performing insert recording, the playback picture can be monitored on the viewfinder screen.

1 **While pressing the small button, set the POWER switch to CAMERA.**

2 **Turn the STANDBY switch to STANDBY to set the unit to recording pause mode.**

3 **Keep pressing the "+" or "–" side of the EDITSEARCH button and release the button at the point where the insert should end.**
The unit will be set to recording pause mode.

4 **Display the counter in the display window and press the RESET button.**
The counter is reset to zero.
(For an accurate ending point, press the RESET button immediately after the EDITSEARCH button is released and while the still picture is displayed.)

5 **Keep pressing the "–" side of the EDITSEARCH button and release the button at the point where the insert should begin.**

6 **Press the ZERO MEM button.**
The insert ending point is stored in memory.

7 **Press the START/STOP button.**
Insert recording will begin.

The insert recording will stop automatically near the counter zero point.

Insert the Recording

To cancel ZERO MEM mode
Press the ZERO MEM button so that the ZERO MEM indicator disappears.

To change the insert ending point
Press the ZERO MEM button to turn off the ZERO MEM indicator and repeat steps 3 through 6.

To insert the date or time

1 **Follow steps 1 through 6.**

2 **Press the DATE or TIME button.**
The date or time indication appears on the viewfinder screen.

3 **Press the START/STOP button.**
The insert recording will begin.

Notes on ZERO MEM mode
ZERO MEM mode is cancelled automatically in the following cases.

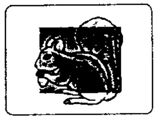
- When an insert recording is completed.
- When the position of the POWER switch is changed.
- When the power is turned off.
- When the cassette is ejected.

To restore it, press the ZERO MEM button again.

Notes

- When recording pause mode lasts for approximately 5 minutes, pause mode will be automatically released and the unit will be set to stop mode.
- When the inserted tape is played back, the picture may be distorted at the end of the inserted program.

G-1

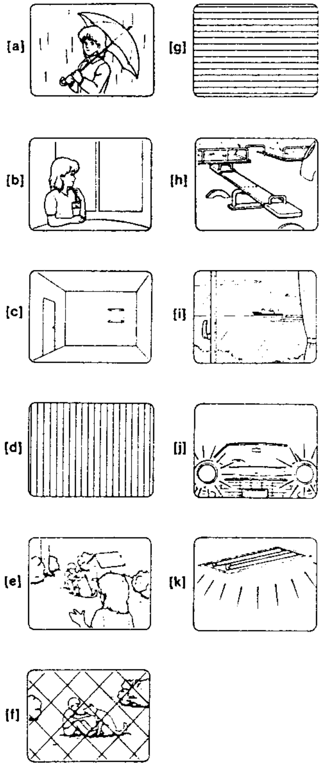


Focusing

Auto Focusing

Under most shooting condition, the Auto Focus function of this unit brings the subject into focus automatically.
The auto focus system incorporated in this unit utilizes high-precision sensors to determine picture contrast at the center of the viewfinder screen (the blue portion marked in the illustration) and adjust focus accordingly for automatic, highly accurate focusing. G-1

G-2



Manual focusing

Manual focusing is recommended in the following conditions. G-2

[a] Insufficient light

[b] Too much bright light behind the subject

[c] Subjects with flat colours and less contrast — wall, sky, etc.

[d] Finely detailed repetitive patterns

[e] When the distance between subjects at the center is extreme (e.g. one subject is close, the other is away)

[f] Subjects beyond screens, nets, etc. or when another subject passes across the camera

[g] Horizontal stripes

[h] Diagonal object

[i] When there is frosted glass between the shooting object and the recorder

[j] Bright object or object reflecting light

[k] When shooting under a fluorescent lamp at the shutter speed set to 1/250, 1/1000, 1/2000 or 1/4000

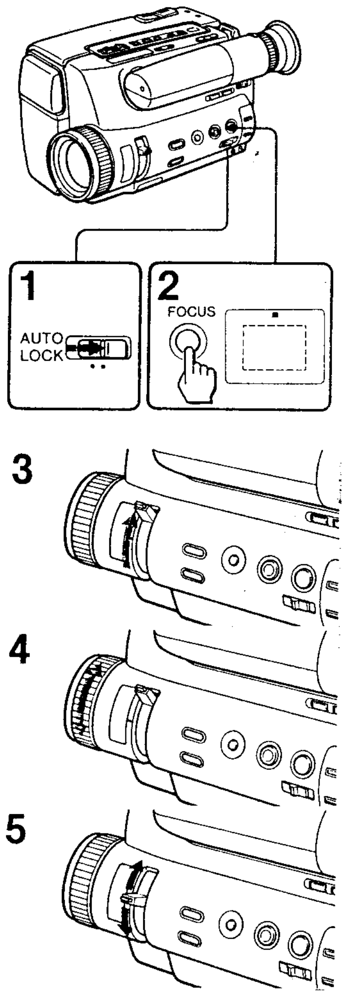
Notes
Auto focus does not function momentarily in these cases:

- When the shutter speed or the white balance is changed
- When the back light function is working
- When lighting conditions change quickly
- When the zooming is changed from wide-angle to telephoto

It may take several seconds to get focus when the camera is rapidly panned from a distant subject to a near subject with less contrast. In this case, adjust the focus manually.

Note on automatic adjustment
During recording with auto focusing, do not turn or stop the focus ring forcibly.

G-3



Focusing

To Focus Manually G-3

1. **Set the AUTO LOCK switch to the right position.**

2. **Press the FOCUS button.**
   The white mark (■) will be shown in the viewfinder and the auto focus frame will disappear.

3. **Turn the manual zoom lever to the telephoto position (66) to make the subject as large as possible in the viewfinder.**

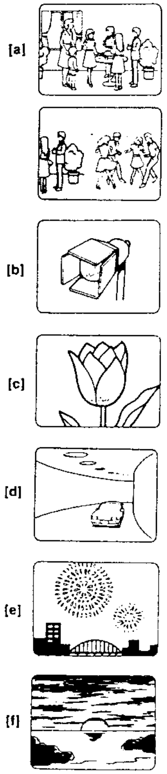
4. **Turn the focus ring to achieve sharp focus.**

5. **Set the desired shot length using the manual zoom lever.**

Some helpful hints

- When shooting a scene with lots of movement in bright light, the subject can be kept in good focus by setting the zoom lever to the wide-angle position and the focus ring to 2 m, regardless of the distance between the subject and the recorder.
- When shooting in low light situations such as indoors, the depth of field in proper focus is very shallow. For best results, shoot at wide angles, after focusing in telephoto.
- The figures on the focus ring indicate the distance between the subject and the lens surface.
- Recommended illumination of this unit is more than 300 lux (28 footcandles). If shooting is done indoors or under other circumstances where light is insufficient, video lights must be used for best results. Under adequate light condition, the depth of field in proper focus is wider and a sharper picture will be recorded.

H-1



White Balance Function

Automatic White Balance Function

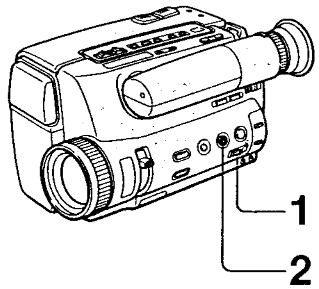
In most cases, the auto white balance function of this unit adjusts the white balance automatically. However, if it does not work correctly in the conditions listed below, adjust the white balance manually.

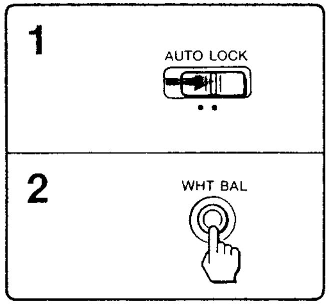
Manual White Balance Function

Difficult Conditions for Auto White Balance H-1

[a]	When lighting conditions change quickly	☼
[b]	When the light source for the subject is different from that illuminating this unit, such as when the subject is in a spotlight, etc.	☼
[c]	When shooting a monochromatic subject or the background is monochromatic	HOLD
[d]	When recording under a sodium lamp	☼
	When recording under a mercury lamp	☼
	When recording under a colour matching fluorescent lamp	☀
[e]	When recording outdoors, such as a night view, neon sign or fireworks	☀
[f]	When recording outdoors, such as scenes after sunset or scenes before sunrise.	☀

H-2





White Balance Function

To Adjust the White Balance Manually

H-2

1. **While pressing the small button, set the POWER switch to CAMERA.**
2. **Set the AUTO LOCK switch to the right position.**
3. **Select the desired white balance mode by pressing the WHT BAL button.**
   Each push of the WHT BAL button cyclically changes the indication inside the viewfinder.

   No indication (Auto) → HOLD → ☀ → ☼ → No indication (Auto)

For the colour temperature and the white balance adjustment, see page 58.

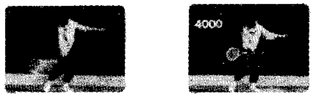
To adjust the white balance precisely

1. **While pressing the small button, set the POWER switch to CAMERA.**
2. **Turn the STANDBY switch to STANDBY.**
3. **Point the recorder to a white, flat object such as a white wall, paper, etc.**
4. **Press the WHT BAL button to indicate the HOLD mark inside the viewfinder.**

Notes

- When the power is turned off or the light source is changed, reset the HOLD mode again.
- The white balance is related to shutter speed adjustment. When the shutter speed is adjusted manually, if the recorder is moved indoor to outdoor or vice versa, set the AUTO LOCK switch to AUTO LOCK and reset it to the right position again.
- When the recorder has been moved indoor to outdoor, or vice versa, turn the STANDBY switch to STANDBY and point the recorder to a white object for about 10 seconds so that the white balance is adjusted properly.

I-1



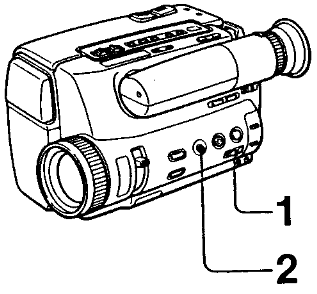
Shutter Speed Adjustment

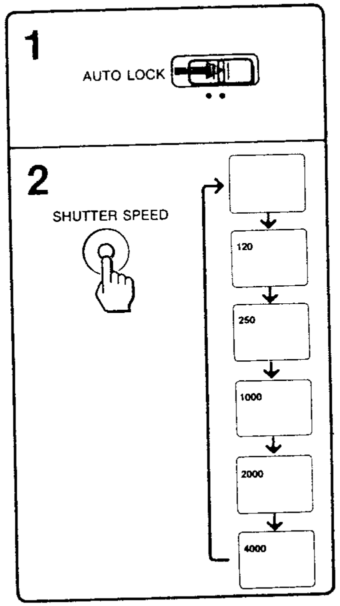
When a fast-moving subject is recorded at a normal shutter speed, the picture may not be seen clearly when played back I-1. This can be improved by increasing the shutter speed.
The shutter speed of this unit can be selected from six speeds, 1/50 (normal speed), 1/120, 1/250, 1/1000, 1/2000 or 1/4000 second.
However, when the shutter moves fast, it will not allow enough light to come into the lens, so the picture will be dark. Therefore, when recording at a high shutter speed, record in a brighter place than usual.
Choose an appropriate shutter speed according to the place and situation.
See the chart below for examples.

Example use	Recommended shutter speed
• On clear days, recording golf or tennis scenes (To view the hit ball clearly in the pause mode, set to 1/4000) • On clear days, recording the skiers	1/4000 or 1/2000
• On overcast days, recording a moving merry-go-round or jet-coaster • Recording outdoors from inside a vehicle (for stable shooting)	1/1000 or 1/250
• Instead of the ND2 filter (To reduce the exposure level to approx. 1/2) • Recording indoors (for stable shooting)	1/120

Shutter Speed Adjustment

I-2





I-2

1 **Set the AUTO LOCK switch to the right position.**

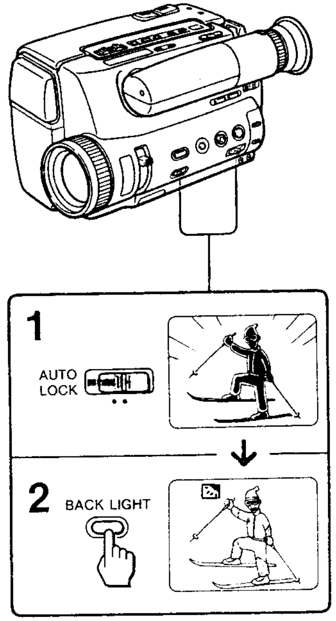
2 **Press the SHUTTER SPEED button repeatedly until the desired shutter speed indication appears on the viewfinder screen.**
Each time the SHUTTER SPEED button is pressed, the indication changes:
No
indication → 120 → 250 → 1000 → 2000 → 4000
(1/50) (1/120)(1/250)(1/1000)((1/2000)(1/4000)

Auto focus will not function when a shutter speed other than the normal speed and 1/120 is selected under a fluorescent lamp.
When shooting, use manual focusing.

Notes

- When shutter speed 1/250 or faster is selected, recording must be done under sunlight or video light.
- When the recording is done under a light discharged tube, such as a fluorescent lamp, sodium lamp, or mercury lamp, the brightness of the recorded picture may vary ("flicker").
- When the shutter speed is changed during a camera recording of a TV screen, the brightness of the recorded picture may vary.
- When a very bright object is shot at a faster shutter speed, a light, vertical, belt-like line ("smear") may appear on the screen.

J



Back Light Adjustment

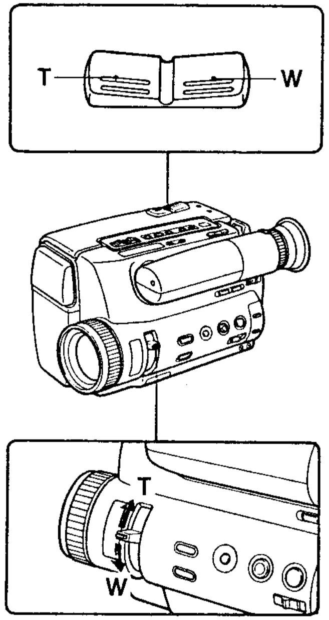
In this unit iris is automatically controlled. However, when shooting a subject that is backlit, that is the light source is coming in from the back of the subject, you should do the following steps.

1 **Set the AUTO LOCK switch to the right position.**
The previous back light mode which is before setting the AUTO LOCK switch to the left position will be recalled.

2 **Press the BACK LIGHT button.**
The ▨ indication appears in the viewfinder screen when the BACK LIGHT button has been pressed.

After shooting that particular scene, be sure to press the BACK LIGHT button again to release to record. Otherwise the recorded picture will be too bright.
The ▨ indication goes out.

K-1



Zooming

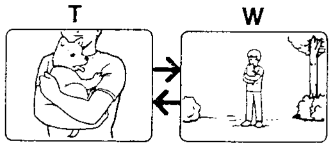
The size of the subject in the scene can be changed.

Power Zoom K-1

— for smooth and constant zooming

Press the T side of the power zoom button for telephoto and the W side for wide-angle.
The zoom lever will move automatically.

K-2



Manual Zoom K-2

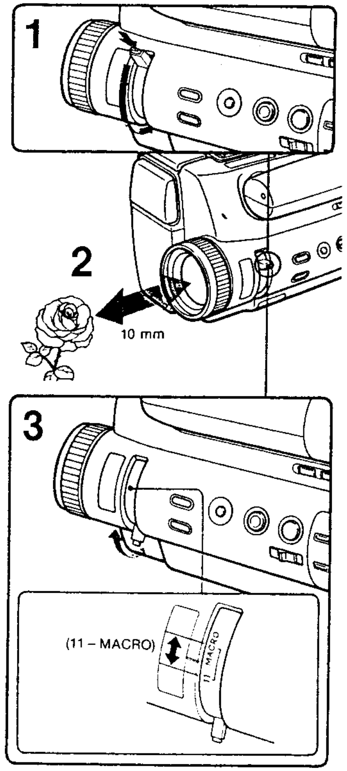
— to create a dramatic effect

Turn the manual zoom lever upward for telephoto and downward for wide-angle.

For more zooming effect

- Use an optional conversion lens (VCL-1446B or VCL-0746B) and the supplied step-up ring. Auto focus, however will not function in that case.
- The focal length of this unit is f-11 mm to 66 mm.
  Converted into the focal length of a 35 mm camera, this means approximately 58.5 to 351 mm.

L



Close-ups (Macro) L

Even tiny objects can literally fill the screen for dramatic close-up effects.

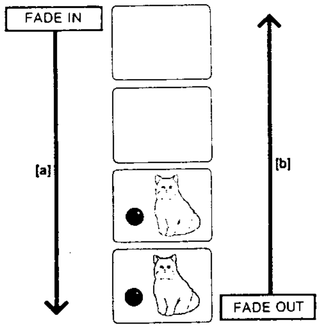
1. **Turn the zoom lever to the MACRO position, pressing the macro set button.**
2. **Bring the recorder as close as necessary to obtain the desired subject size.**
   The subject can be as close as approximately 10 mm ($^{13}/_{32}$ in.) from the lens surface.
3. **Turn the zoom lever within the MACRO range to focus sharply.** (The power zoom button can be used instead of the zoom lever.)

Notes

- Auto focusing does not function in macro shooting.
- If the subject is closer than 10 mm, it cannot be brought into focus.
- When shooting in macro, the depth of field is very shallow, so pay attention to focus. To keep the subject in focus, use a tripod or monopod.

Fade-in and Fade-out Function

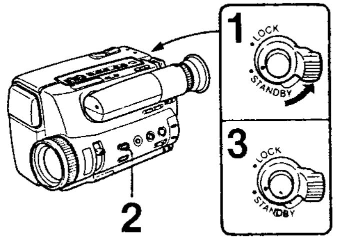
M-1



M-1

When fade-in, the picture and sound will gradually fade-in from a white background [a]. When fade-out, the picture and sound will gradually fade out to white. [b]
A natural beginning and ending effects can be added by using fade-in at the beginning of a recording and fade-out at the end of a recording.

M-2



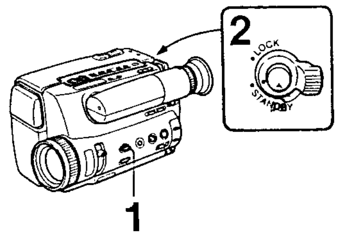
How to Fade-in M-2

1 Turn the STANDBY switch to STANDBY to set the unit to the standby mode.

2 Press the FADER button.

3 Press the START/STOP button.
Fade-in will be performed and recording will start.

M-3



How to Fade-out M-3

1 While recording, press the FADER button.

2 Press the START/STOP button.
Fade-out will be performed and then recording will stop.

To cancel the fade-in and fade-out function
Before pressing START/STOP button, press the FADER button again.

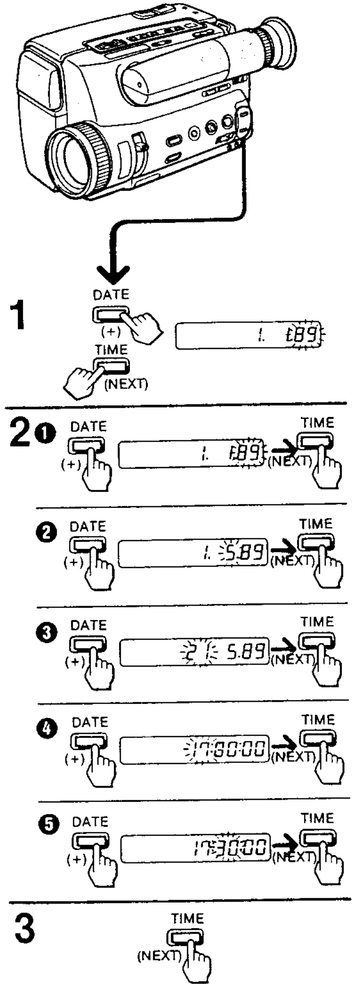
Note
Fade-in or fade-out is cancelled automatically after it has been performed.

Recording Date or Time

Once the date and the current time are adjusted, the date or time can be recorded together with the picture.

Before setting the date and time, make sure that power sources and lithium battery are installed.

N-1



To Set Date and Time N-1

1 **Press the DATE and TIME buttons simultaneously for more than 3 seconds.**
The date indication will appear in the display window (date/time setting mode.)
The DATE button now functions as the + button and the TIME button functions as the NEXT button.

2 **Adjust ❶ year, ❷ month, ❸ day, ❹ hour and ❺ minute in sequence, following the illustration.**
First adjust the blinking digits with the + button, and then press the NEXT button.

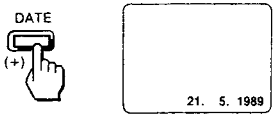
3 **Press the NEXT button at the same time with an announced time signal.**

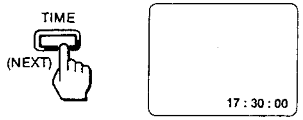
The clock starts operating. There is no need to readjust the date and time as long as the lithium battery remains.

To clear the time indication from the display
Press the TIME (NEXT) button again.

The + button can be pressed in two ways
- When you keep the button pressed, the digits will advance continuously.
- When you press and immediately release the button, the digits will advance by one.

N-2





Recording Date or Time

To check the preset date and time
Press the DATE or TIME button in the recording pause mode. When the same button is pressed again, the indication goes out.

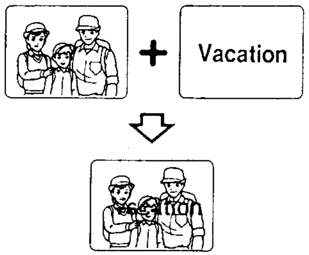
To readjust an incorrect date or time
Set the unit to date/time setting mode and press the NEXT button repeatedly until the incorrect digit blinks. Correct it with the + button and press the NEXT button. After adjusting the minute digits, press the NEXT button at the same time with an announced time signal.

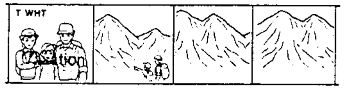
To Record the Date or Time N-2

During camera recording or in recording pause mode, press the DATE or TIME button to display the date or time on the viewfinder screen.
The date or time being displayed will be recorded together with the picture.

To stop recording the date or time
Press the DATE or TIME button again. The picture recording will continue.

O-1





Recording a Title

Before recording, memorize a title or figure.
The memorized title or figure is superimposed onto the picture being recorded. O-1

- One title or figure can be memorized.
- The colour of the title or figure can be selected from 8 colours.

Make sure that the lithium battery is installed. See page 14.

Preparations

To make a desired title card

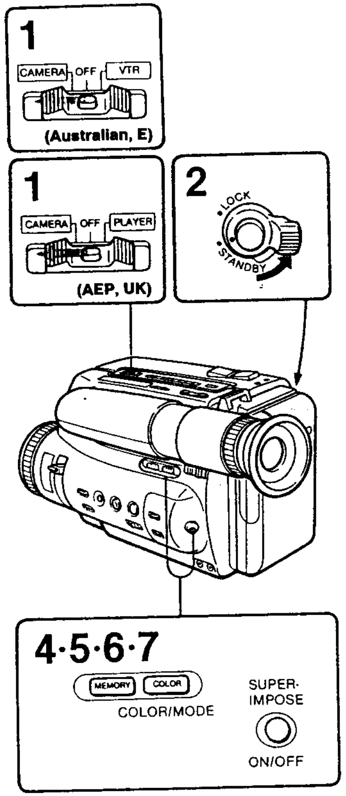
- Use a white and plane card and draw the title on it with a deep colour (black is recommended for the best result) in thick letters.
  If contrast is clear, a print or signboard can be memorized like the title card.
- When deciding the title size, check the effective picture size on your video monitor.

Before memorizing the title

- Fix the title card and the video camera recorder.
- Use of an appropriate light is recommended for a better result.

Function of the COLOR/MODE button
This button is used to select the title colour or title mode.

When the title is displayd	**When the title is not displayed**
Used as the COLOR button.	Used as the MODE button.
→ WHT → BLUE → GRN → CYAN (white) (green) BLK ← YEL ← VIO ← RED ← (black) (yellow) (violet)	No title mode ← → ↑ → ■ → ■↑ ↑: title scroll mode ■: title reverse mode ■↑: title reverse and scroll mode
Each push of the COLOR/MODE button cyclically changes the colour or mode.	



To Memorize the Title O-2

1 **While pressing the small button, set the POWER switch to CAMERA.**

2 **Turn the STANDBY switch to STANDBY to set the unit in the recording pause mode.**

3 **Point the camera to the title card and adjust the focus.**

4 **Press the SUPERIMPOSE button.**

5 **Press the MEMORY button to memorize the title.**

6 **Select the title colour while observing the colour indication in the viewfinder.**
Each push on the COLOR/MODE button cyclically changes the colour, as follows:

WHT (white) → BLUE → GRN (green) → CYAN
↑ ↓
BLK (black) ← YEL (yellow) ← VIO (violet) ← RED

7 **Press the SUPERIMPOSE button to turn off the title.**

Notes
- The colour indication in the viewfinder is not recorded on the tapes.
- You can change the title colour even after starting the recording.

To check the title
To check the memorized title, press the SUPERIMPOSE button. To turn off the title, press the button again.

To Record the Title

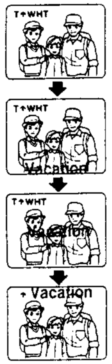
To record the title from the beginning
Press the SUPERIMPOSE button in recording pause mode, and then start recording.

To record during camera recording
Press the SUPERIMPOSE button at the point from which the title is to be inserted.
The memorized title will be recorded together with the picture.

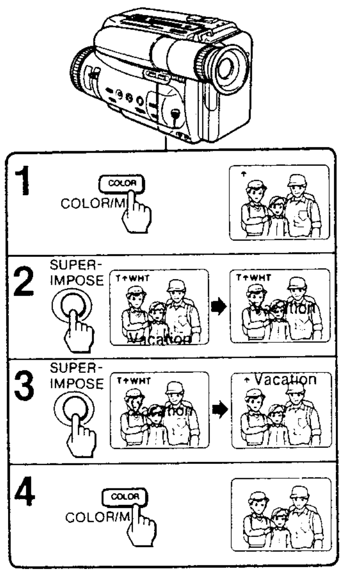
To stop recording the title
Press the SUPERIMPOSE button again. The picture recording will continue.

To record the same title several times
By repeating the above procedure, you can record the title as many times as desired.

O-3



O-4



To Scroll the Title from Bottom to Top

During recording, the memorized title can be scrolled from bottom to top. O-3

To check the scrolled title O-4

1 **In the recording pause mode, press the COLOR/MODE button.**
The arrow mark will be displayed.

2 **Press the SUPERIMPOSE button.**
The title will be displayed from bottom to centre.

3 **Press the SUPERIMPOSE button again.**
The title will be displayed from centre to top.

4 **Press the COLOR/MODE button three times.**
The arrow mark will disappear.

To record the scrolled title

1 **In the recording pause mode, press the COLOR/MODE button.**
The arrow mark will be displayed.

2 **Start the camera recording.**

3 **Press the SUPERIMPOSE button at the point from which the scrolled title is to be recorded.**

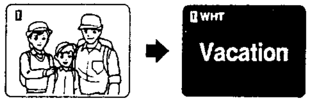
4 **After the title stops at the centre of the picture, press the SUPERIMPOSE button again.**
The title is scrolled from centre to top.

To clear the scroll mode
After recording, press the COLOR/MODE button **three times.**

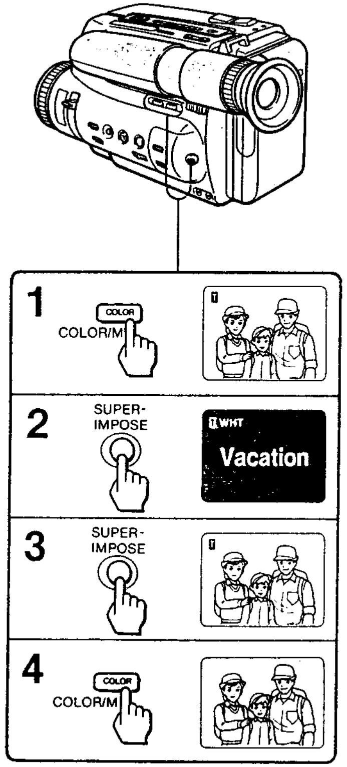
If you do not want to record the picture for the background
Point the recorder to a white, flat object such as a white wall, paper, etc.

To change the colour of the title
While the title is being scrolled or displayed at the centre, press the COLOR/MODE button.

O-5



O-6



To Reverse the Title and the Background

The colour scheme of the title and the background can be reversed. O-5

To check the reversed picture O-6

1. **In the recording pause mode, press the COLOR/MODE button twice.**
   The T mark will be displayed.
2. **Press the SUPERIMPOSE button.**
   The reversed title and background will be displayed.
3. **Press the SUPERIMPOSE button again.**
4. **Press the COLOR/MODE button twice.**
   The T mark will disappear.

To record the reversed picture from the beginning

1. **In the recording pause mode, press the COLOR/MODE button twice.**
   The T mark will be displayed.
2. **Press the SUPERIMPOSE button.**
3. **Start the camera recording.**
4. **Press the SUPERIMPOSE button again to clear the reversed picture.**

To record the reversed picture during recording

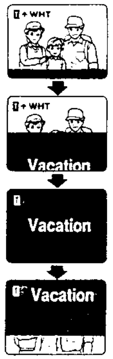
1. **In the recording pause mode, press the COLOR/MODE button twice.**
   The T mark will be displayed.
2. **Start the camera recording.**
3. **Press the SUPERIMPOSE button at the point from which the reversed picture is to be recorded.**
4. **Press the SUPERIMPOSE button again to clear the reversed picture.**

To clear the reverse mode
After recording, press the COLOR/MODE button twice.

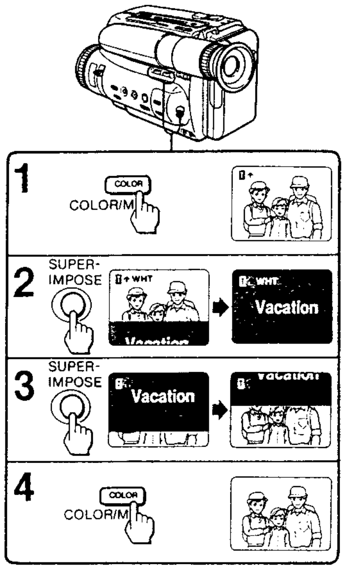
If you do not want to record the picture for the background
Point the recorder to a white, flat object such as a white wall, paper, etc.

To change the colour of the background
While the title is being displayed, press the COLOR/MODE button.

O-7



O-8



Recording a Title

To Scroll the Reversed Title O-7

To check that the reversed title is scrolled O-8

1. **In the recording pause mode, press the COLOR/MODE button three times.**
   The arrow mark and the T mark will be displayed.

2. **Press the SUPERIMPOSE button.**
   The reversed picture will be displayed from bottom to centre.

3. **Press the SUPERIMPOSE button again.**
   The title will be displayed from centre to top.

4. **Press the COLOR/MODE button once.**
   The marks will disappear.

To record the reversed and scrolled title

1. **In the recording pause mode, press the COLOR/MODE button three times.**
   The arrow mark and the T mark will be displayed.

2. **Start the camera recording.**

3. **Press the SUPERIMPOSE button at the point from which the reversed and scrolled title is to be recorded.**

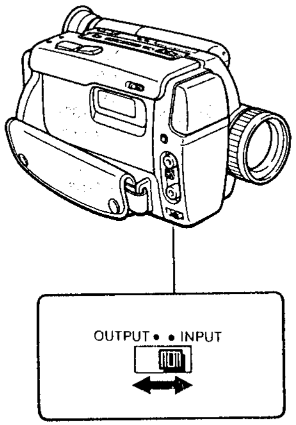
4. **After the reversed title stops at the centre of the picture, press the SUPERIMPOSE button again.**
   The reversed title is scrolled from centre to top.

To clear the reversed scroll mode
After recording, press the COLOR/MODE button once.

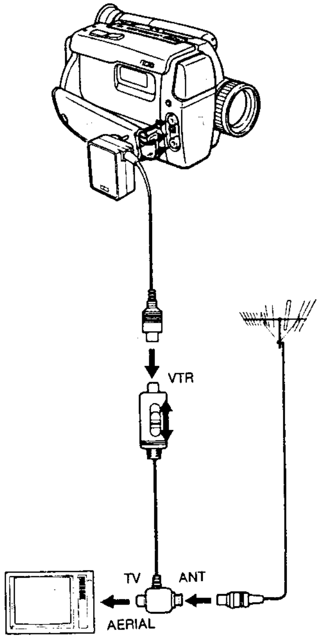
If you do not want to record the picture for the background
Point the recorder to a white, flat object such as a white wall, paper, etc.

To change the colour of the background
While the title is being displayed, press the COLOR/MODE button.

P-1 **(Australian, E)**



P-1 **(AEP, UK)**



VTR Operation

Preparation for Playback

When the VTR is connected to the TV, refer to pages 49 and 50.

About the AUDIO/VIDEO Jacks P-1

The Audio/Video jacks work as both input jacks and output jacks. Set the INPUT/OUTPUT selector switch as follows.

to OUTPUT position	to view playback tape
to INPUT position	to record from TV or other tape

Connecting a TV

Connecting a TV without audio/video input connectors P-1

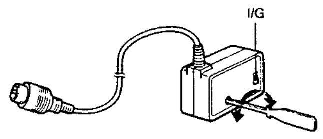
1. **Connect the RFU adaptor to the CCD-TR55E.**

2. **Connect the aerial, CCD-TR55E and TV to the aerial selector** (supplied with the RFU-89EA).
   Use a 75-ohm coaxial cable for aerial connection.

3. **Set the selector switch on the aerial selector as follows:**
   For viewing a playback picture → VTR
   For viewing TV programmes → ANT

On the TV programme position for the video camera recorder
Adjust one of the TV programme positions to receive the signal from the video camera recorder, referring to "Adjusting the TV" on page 47.
Whenever you view the playback picture, select the programme position adjusted for the video camera recorder on the TV.

P-2 (AEP, UK)



Preparation for Playback

Adjusting the TV P-2

1 Turn on the TV and select a programme position which is not being used to receive a TV station.

2 Set the POWER switch of the CCD-TR55E to CAMERA and turn the STANDBY switch to STANDBY.

3 Set the I/G selector on the RFU-89EA according to the TV system of your country.

4 Set the selector switch of the aerial selector to VTR.

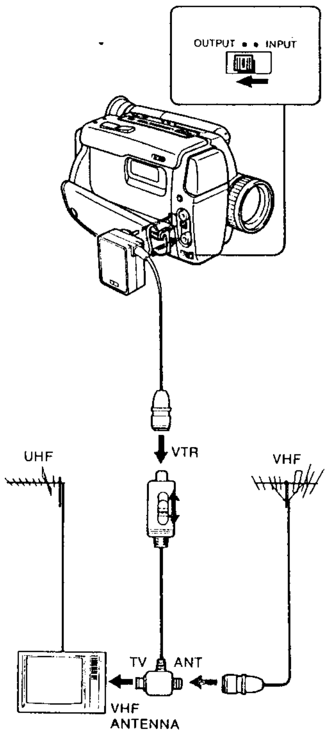
5 Tune the TV until you see the picture and hear the sound from the CCD-TR55E.

If the playback picture is not free of disturbance

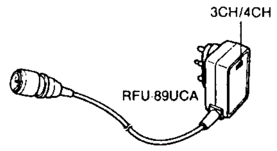
1 Set the selector switch of the aerial selector to ANT.
2 Adjust the programme position of the TV to a channel between UHF channels 30 and 39 with the tuning control or the fine tuning control on the TV, so that the TV screen shows no picture and so that a steady rustling sound or no sound is heard.
3 Set the selector switch of the aerial selector to VTR.
4 Slowly turn the RF channel of the RFU-89EA with the supplied screwdriver, until the picture from the CCD-TR55E becomes clear.

Now the TV adjustment is complete.

P-2 (Australian, E)



P-3 (Australian, E)



Preparation for Playback

Connecting a TV

Connecting a TV without audio/video input connectors P-2

1 **Connect the RFU adaptor to the CCD-TR55E.**

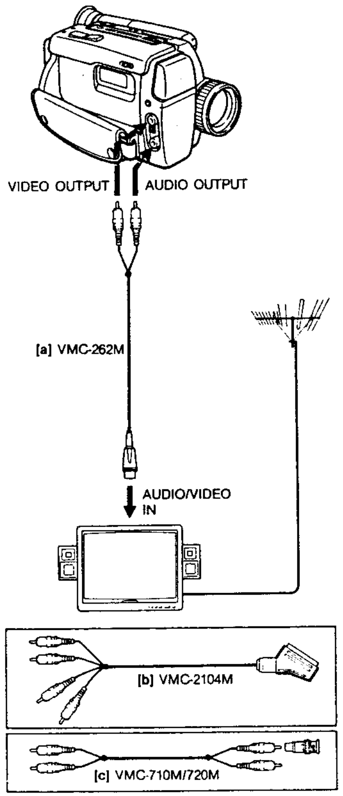
2 Select **OUTPUT** with the INPUT/OUTPUT selector switch.

3 **Connect the VHF antenna, CCD-TR55E and TV to the antenna selector** (supplied with the RFU-89UCA).
Use a 75-ohm coaxial cable for antenna connection.

4 **Set the selector switch on the antenna selector as follows:**
For viewing a playback picture → VTR
For viewing TV programs → ANT

On the TV channel for the video camera recorder P-3
When you view the playback picture, set the channel selector of the RFU adaptor to either VHF channel 3 CH or 4 CH and select the same channel on the TV.

P-3 **(AEP, UK)**


VIDEO OUTPUT
AUDIO OUTPUT
[a] VMC-262M
AUDIO/VIDEO IN
[b] VMC-2104M
[c] VMC-710M/720M

Connecting a TV (or colour monitor) equipped with audio/video input connectors P-3

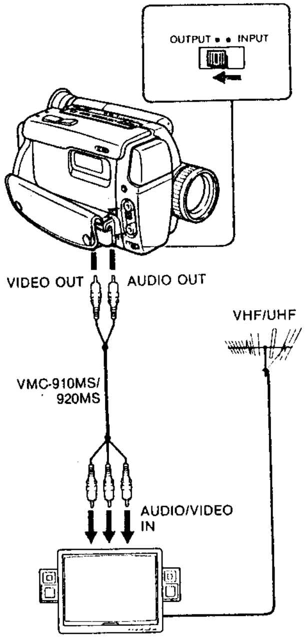
Leave the TV aerial cable connected to the TV.

1 **Connect the CCD-TR55E to the TV using an optional connecting cable to match the connectors on the TV.**
[a] VMC-262M to a 6-pin DIN connector
[b] VMC-2104M: to a 21-pin connector (EUROCONNECTOR)
[c] VMC-710M/720M: to phono and BNC-type connectors.

2 **Set the TV/VIDEO selector button on the TV as follows.**
For viewing a playback picture → VIDEO
For viewing TV programmes → TV

Note
When the TV has stereo audio inputs, use the optional VMC-910MS/920MS connecting cord or equivalent.

P-4 **(Australian, E)**


OUTPUT • • INPUT
VIDEO OUT
AUDIO OUT
VHF/UHF
VMC-910MS/920MS
AUDIO/VIDEO IN

Connecting a TV (or color monitor) equipped with audio/video input connectors P-4

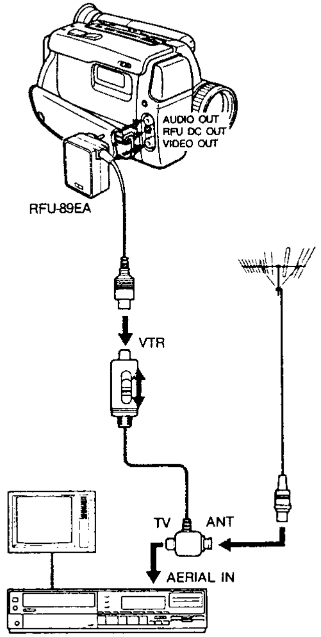
Leave the TV antenna cable connected to the TV.

1 **Connect the CCD-TR55E to the TV using the optional VMC-910MS/920MS audio/video cable.**

2 Select OUTPUT with the INPUT/OUTPUT selector switch.

3 **Set the TV/VIDEO selector button on the TV as follows.**
For viewing a playback picture → VIDEO
For viewing TV programs → TV

P-4 (AEP, UK)



Preparation for Playback

Connecting a TV connected to another VTR without an input selector P-4

1 **Connect the RFU adaptor to the CCD-TR55E.**

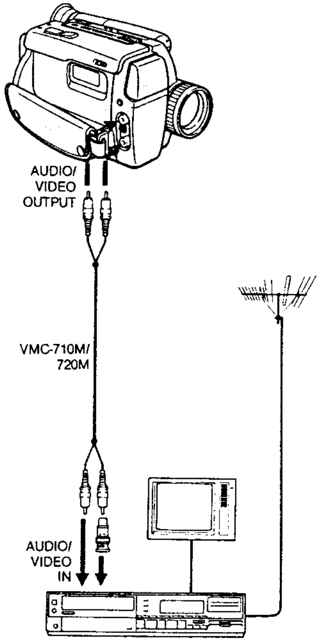
2 **Connect the aerial and the VTR to the aerial selector (supplied with the RFU-89EA).**
Use a 75-ohm coaxial cable for aerial connection.

3 **Set the selector switch on the aerial selector as follows:**
For viewing a playback picture → VTR
For viewing TV programmes → ANT

4 **Set the TV/VTR selector on the VTR to TV.**

On the TV programme position for the video camera recorder
Adjust one of the TV programme positions to receive the signal from the video camera recorder, referring to "Adjusting the TV" on page 47.
Whenever you view the playback picture, select the progamme position adjusted for the video camera recorder on the TV.

P-5 (AEP, UK)



Preparation for Playback

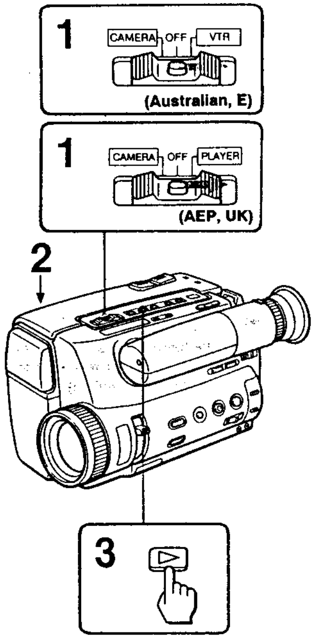
Connecting a TV connected to another VTR with an input selector P-5

1 **Connect the CCD-TR55E to the VTR using the optional VMC-710M/720M connecting cable.**

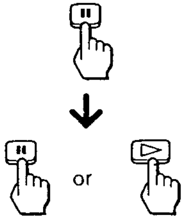
2 **Set the input selector on the VTR to LINE.**

Note
When the VTR to be connected has stereo audio inputs, use the optional VMC-910MS/920MS connecting cord or equivalent.

Q-1



Q-2



Playback

Turn on the TV (or colour monitor), and select the programme position for viewing a playback picture (or set the TV/VIDEO selector to VIDEO).

Q-1

1 **While pressing the small button, set the POWER switch to PLAYER. (AEP, UK)**

1 While pressing the small button, set the POWER switch to VTR. **(Australian, E)**

2 **Insert a cassette.**

3 **Press the ▷ button.**
Playback will start.

To stop the tape, press the □ button.

After using, be sure to set the POWER switch on the recorder to OFF.

To view a still picture Q-2
Press the **II** button during playback. To resume playback, press the **II** button again or press the ▷ button.

Note
Streaks will appear and sound will be muted in the still picture mode.

Monitoring a High-Speed Picture

During playback — Picture search

1 **In the playback mode, press the ◀◀ or ▶▶ button.**
The picture will be monitored at high speed as long as it is kept pressed.

2 **Release the ◀◀ or ▶▶ button at the desired point.**
Normal playback will resume.

During fast-forward or rewind — Skip scan

1 **Press the ▶▶ button in fast-forward mode or press the ◀◀ button in rewind mode.**
The picture is displayed while the button is kept pressed.

2 **Release the ▶▶ or ◀◀ button to resume normal fast-forward or rewind mode.**

Notes
- If you move the position of the POWER switch during playback, the tape will stop. When you move the POWER switch to CAMERA in the playback pause mode, however, the unit will enter recording pause mode.
- When the pause mode lasts for 5 minutes or more, the unit will automatically enter the stop mode.
- Streaks will appear and the sound will be muted in the high-speed picture.
- When a tape is recorded in SP mode, a still picture and high-speed picture may be noisy with many streaks and become black and white. Streaks will be wider than those of an LP-recorded tape.

TV Program Recording

(Australian, E)

The following connections make both TV program viewing and recording possible.

Combination of the Equipment to be Used

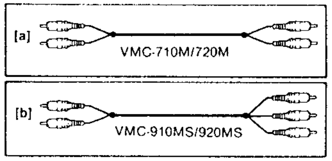
Connection example 1
To connect the VCR without input selector

Connnection example 2
To connect the TV tuner and color monitor or TV with audio/video input and output jacks

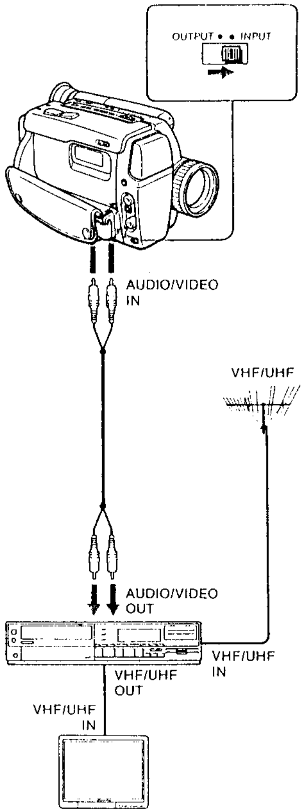
Connecting Cables R-1

- For antenna cable connections, use 75-ohm coaxial cables.
- For video/audio connection, use an optional audio/video cable to match the connectors on the equipment to be connected.
  [a] Optional VMC-710M/720M for monaural equipment
  [b] Optional VMC-910MS/920MS for stereo equipment

R-1



R-2



TV Program Recording

Connection Example 1
To connect the VCR with an input selector R-2

Connections
Connect the equipments as shown in the illustration.
Make sure that the INPUT/OUTPUT selector switch is set to INPUT.

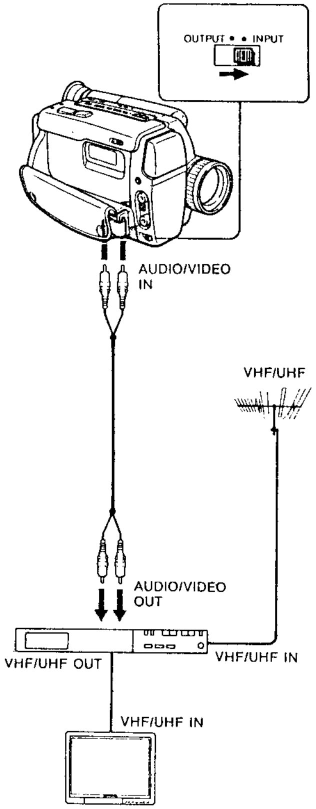
TV program recordings

1. Turn on the VCR and TV.
2. While pressing the small button, set the **POWER switch on the CCD-TR55E to VTR.**
3. Select the channel for the VCR on the TV.
4. Set the input selector to TUNER, the TV/VTR select button to VTR and select the TV channel to be recorded on the VCR.
5. **Insert a cassette into the CCD-TR55E and** slide the ● REC switch.
   Recording will start.

To view another TV program while recording
Set the TV/VTR select button on the VCR to TV and select the desired program on the TV.

Playback
See "VTR Operation".

R-3



TV Program Recording

(Australian, E)

Connection Example 2

To connect the TV tuner and color monitor or TV with audio/video input and ouput jacks **R-3**

Connections
Connect the equipments as shown in the illustration.
Make sure that the INPUT/OUTPUT selector switch is set to INPUT.

TV program recording

1 Turn on the TV tuner or TV.

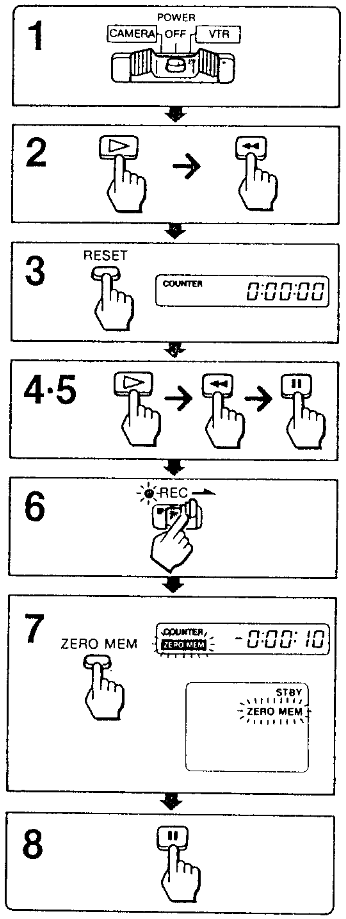
2 While pressing the small button, set the **POWER switch on the CCD-TR55E to VTR.**

3 Set the input selector on the TV tuner or TV to TV and select the TV channel to be recorded.

4 **Insert a cassette into the CCD-TR55E and** slide the ● REC switch.
Recoring will start.

Playback
See "VTR Operation" on page 92.

S



Insert Recording 2

(Australian, E)

To Insert a TV Program or a Picture from Another VCR S

Monitor the picture being inserted on the viewfinder screen.

1 **While pressing the small button, set the POWER switch to VTR.**

2 **Locate the point on the tape where the insert should end by pressing the ◄◄ or ►► button during playback.**

3 **Display the counter in the display window and press the COUNTER RESET button.**
The counter is reset to zero.

4 **Press the ◄◄ button during playback to rewind the tape a little further than the point where the insert should begin.**

5 **Release the ◄◄ button to resume playback and press the II button at the insert starting point.**
The pause lamp lights.

6 **Slide the ● REC switch in the arrow direction to set the unit to recording pause mode.**
The recording lamp lights.

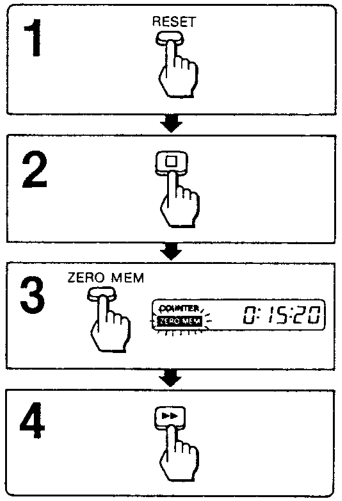
7 **Press the ZERO MEM button.**
The insert ending point is stored in memory.

8 **To start recording, press the II button.**

The insert recording will stop automatically near the counter zero point.

To cancel ZERO MEM mode
Press the ZERO MEM button so that the ZERO MEM indicator disappears.

R



Use of the Tape Counter

During recording or playback, the digits on the counter indicate the actual recording or playback time.

To Index the Whole Tape

Press the RESET button at the beginning of the tape so that the counter shows "0:00:00". By noting the counter reading at a particular point, you can easily find that point later by referring to the tape counter.

Notes
- The counter reading and the point of the tape may not correspond exactly. Use the counter as a guide.
- The counter does not operate for a blank, unrecorded portion of a tape.
- There will be a time lag of several seconds on the counter reading after repeated fast-forward and rewind operations.
- There will be also a time lag of several seconds when the tape recorded in LP and SP modes mixed or the tape having a blank portion between the recorded portions is played back.

To Return to a Pre-registered Point R

1 **During recording or playback, press the RESET button at the point you later want to locate.**

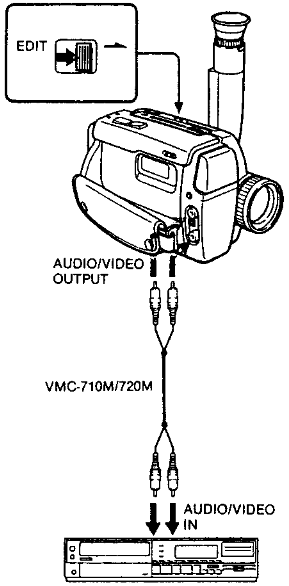
2 **Press the ☐ button when the recording or playback has finished.**

3 **Press the ZERO MEM button.**
The "ZERO MEM" indicator will blink in the display window.

4 **Press the ◀◀ or ▶▶ button.**
The tape will be rewound or sent forward and stop automatically when the counter reaches approximately zero.

Notes
- The ZERO MEM button does not function during recording or playback mode.
- Be sure to press the ZERO MEM button when the tape is stopped.
- The ZERO MEM mode is cancelled automatically once the tape is rewound or sent forward to zero.

S (AEP, UK)



Tape Editing

To edit a home movie tape, you will need another VTR or another video camera recorder.

1 **While pressing the small button, set the POWER switch on the CCD-TR55E to PLAYER and turn on the other VTR.**

2 **Slide the EDIT switch on the CCD-TR55E in the direction of the arrow (ON).**

3 **Set the input selector on the VTR to LINE.**

4 **Press the II button on the CCD-TR55E during playback at the point where you want to start recording.**

5 **Press the record button on the other VTR, pressing the II button.**

6 **Release the II buttons on both units simultaneously.**
Recording will start.

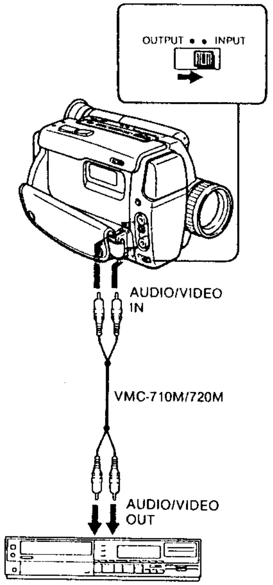
When the VTR to be used is a stereo type, use the optional VMC-910MS/920MS connecting cord or equivalent.

After editing, turn off both units and be sure to slide the EDIT switch in the reversed direction to the arrow (OFF).

To cut off an unnecessary portion
Press the II button on the recorder at the beginning of the unnecessary portion.
Release it where you want to resume recording.

Function of the EDIT switch
Slide this switch in the direction of the arrow (ON) whenever you edit tapes. Signal loss that results from tape-to-tape transfer will be reduced, achieving more accurate signal transfer.
When recording or playing back normally, keep this switch in the reversed direction to the arrow (OFF).

U-1 (Australian, E)



To Edit from Another VCR to the CCD-TR55E U-1

1 Make sure the INPUT/OUTPUT selector switch is set to INPUT.

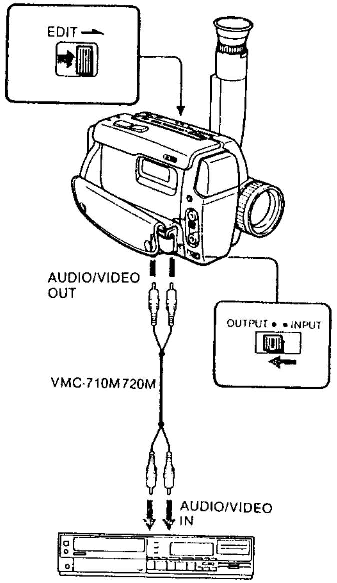
2 While pressing the small button, set the **POWER switch on the CCD-TR55E to VTR.**

3 Start playback on another VCR.

4 **Slide the ● REC switch on the CCD-TR55E.**

When the VCR to be used is a stereo type, use the VMC-910MS/920MS connecting cable.

U-2 (Australian, E)



To Edit from the CCD-TR55E to Another VCR U-2

1 Make sure the INPUT/OUTPUT selector switch is set to OUTPUT.

2 While pressing the small button, set the **POWER switch on the CCD-TR55E to VTR and turn on the other VCR.**

3 **Slide the EDIT switch on the CCD-TR55E in the direction of the arrow (ON).**

4 Set the input selector on the VCR to LINE.

5 **Press the II button on the CCD-TR55E during playback at the point where you want to start recording.**

6 Press the record button on the other VCR, pressing the II button.

7 Release the II buttons on both units simultaneously.
Recording will start.

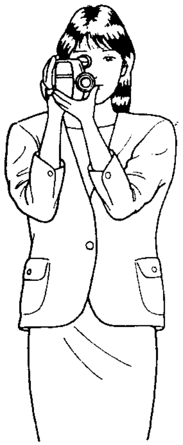
When the VCR to be used is a stereo type, use the VMC-910MS/920MS connecting cord.

After editing, turn off both units and be sure to slide the EDIT switch in the reversed direction to the arrow (OFF).

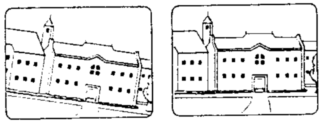
To cut off an unnecessary portion
Press the II button on the recorder at the beginning of the unnecessary portion.
Release it where you want to resume recording.

Function of the EDIT switch
Slide this switch in the direction of the arrow (ON) whenever you edit tapes. Signal loss that results from tape-to-tape transfer will be reduced, achieving more accurate signal transfer.
When recording or playing back normally, keep this switch in the reversed direction to the arrow (OFF).

T-1



T-2



Hints for Better shooting

Basic Camerawork

Getting stable pictures T-1

For hand-held shots, holding the recorder properly is the key.

- Hold the recorder firmly and secure it with the grip strap so that it is easy to manipulate the recorder with your thumb.
- Breathe gently.
- Place your right elbow firmly against your side.
- Stand opposite to the subject and plant your feet firmly in a comfortable position.
- Place your eye firmly against the viewfinder eyecup.
- Try to keep both eyes open.
- Place your left hand under the camera recorder to support it. When adjusting the focus manually, make sure the unit does not move.

Use a tripod or monopod if possible

If you have a tripod for your still camera, it can also be used with the video camera recorder. Use a sturdy one.
If a tripod is not available, try placing the camera on a tabletop, wall, or any other flat surface of suitable height.

Keeping the horizontal plane level

Even if camera work is smooth and stable, shots can be tilted or off axis horizontally.

The horizontal plane can be easily determined by using the viewfinder frame as a reference. T-2

Hints for Better Shooting

Lighting

Try to shoot scenes with the sun at your back

When shooting a scene when the light source is in back of the subject, the subject will be recorded too dark and the background too light.

The followings are also backlight conditions:

- The subject is indoors and there is a window behind the subject.
- Bright sources such as fluorescent or incandescent lamps are included in the scene.
- A person wearing white or glossy clothes in front of a white background. In this case, the face will be recorded too dark.

For the sharpest pictures, you need the best light

For the most brilliant colour in your scenes, a sufficient light level must be maintained. If shooting is done indoors or under other circumstances where light is insufficient, lights must be used for best results.

What kind of light is best? Choosing the right lights

Photography lamps or halogen lamps are recommended. For best results, use of the Sony video lights are recommended as their weight and low heat output levels allow safe, direct connection to the camera.
For lighting of a wide area for easy use—
reflector flood light
To emphasize the subject—use a reflector spotlight.
When using a video light, attach it to the unit with the optional video light attachment.

Hints for Better Shooting

Precautions for using lights

Do not point the light at the recorder body. Instead, make sure that it is pointed parallel to the camera or away from it. Be especially careful with lights. The high heat from the lights pointed at the camera body can warp the cabinet.

For detailed instructions on proper use of lights, carefully read the instruction manuals that accompany them.

Understanding Light and Color

Brightness Levels

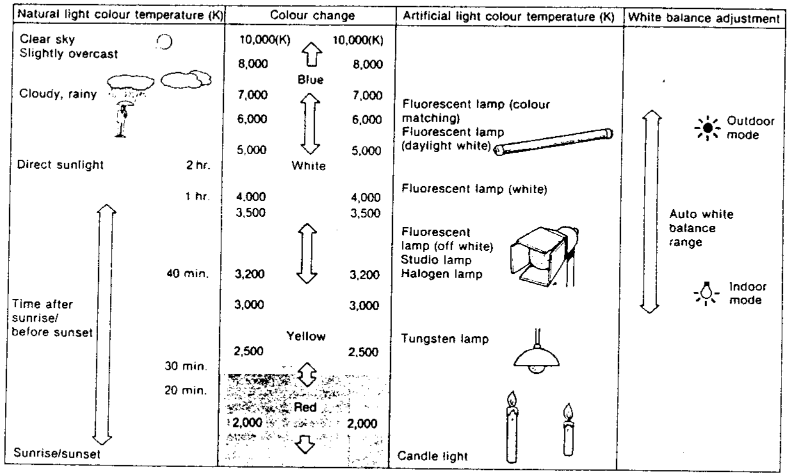
The single greatest influence on picture quality is the brightness level. Using the following chart as a reference, take a few minutes to familiarize yourself with brightness levels to improve your recording.

Snow-covered mountains Snow fields Sandy beach, clear day in summer	Unit: lux	ND filter required
Clear day, mid-day (100,000) Clear day, mid-afternoon (35,000) Overcast day, mid-day (32,000)	100,000	Normal recording
	10,000	
Overcast day, one hour after sunrise (2,000) Office lit by fluorescent lamps, near window (1,000) Clear day, one hour before sunset (1,000)	1,000	
Department store counter (500 – 700) Station wicket (650) Office lit by fluorescent lamps (400 – 500)	500	
Room lit by two 30 W fluorescent lamps (300) Subway station platform (300)	300	Video light recommended
Arcade at night (150 – 200)	100	
Theater lobby (15 – 35) Candle light (10 – 15)	10	Video light required

Hints for Better Shooting

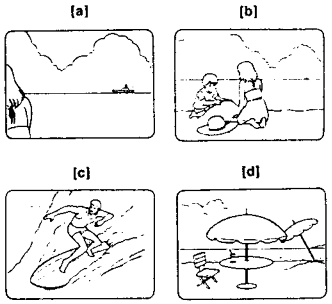
Colour temperature — how it effects white balance adjustment

If the temperature of an object continues to increase, it will eventually begin giving off light. At this time, there is a fixed relationship between the object's temperature and its "light colour." The temperature of the object radiating the light is expressed in absolute temperature (K). This is also known as the colour temperature, which in turn stands for "light colour." As colour temperature increases, the light colour changes from red to yellow to white to blue.



Natural light colour temperature (K)
Colour change
Artificial light colour temperature (K)
White balance adjustment
Clear sky
Slightly overcast
Cloudy, rainy
Direct sunlight
2 hr.
1 hr.
40 min.
Time after sunrise/ before sunset
30 min.
20 min.
Sunrise/sunset
10,000(K)
10,000(K)
8,000
8,000
Blue
7,000
7,000
6,000
6,000
5,000
5,000
White
4,000
4,000
3,500
3,500
3,200
3,200
3,000
3,000
Yellow
2,500
2,500
Red
2,000
2,000
Fluorescent lamp (colour matching)
Fluorescent lamp (daylight white)
Fluorescent lamp (white)
Fluorescent lamp (off white)
Studio lamp
Halogen lamp
Tungsten lamp
Candle light
Outdoor mode
Auto white balance range
Indoor mode

T-3



Hints for Better Shooting

For More Effective Production

Scene length — not too long, not too short

While there's no hard-and-fast rule, it is generally advisable to make each scene 6–7 seconds in length for easier viewing.
A succession of short scenes can tire the viewer, while long, single scenes can become boring.

Cutting according to the narration

Cut the scene when the narration is finished.

Cutting according to the subject T-3

- Make long shots longer [a] ...and close-ups shorter [b].
  Because long shots have more to see in them than colse-ups, show them longer so the viewer may understand what's there.
- Make interesting shots and shots in which the subject is constantly moving longer. [c]
- Make static shots shorter. [d]

Shoot as if you were watching the playback. That is, it's helpful to occasionally imagine your commentary of the scene even as you're shooting it!

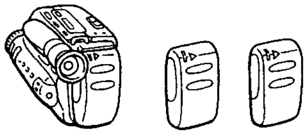
In video, organization is the key

To make a first-class production, it is important to decide the contents and shooting sequence in advance. The first step is to sketch out a simple outline of the actual production based on the time-tested "five W's of journalism" (who, what, where, when, why, how). This will allow you to efficiently and effectively record the many exciting events that happen around you, such as sports matches, graduations, birthday parties, picnics, camping trips, and other special events.

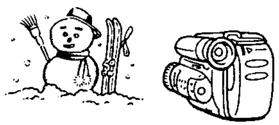
When the tape is edited after recording
Shoot the scene a little longer to make the editing easier.

When the tape is not edited after recording
First record a title and then use the START/STOP function to make a smooth recording.

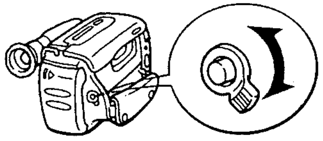
U-1



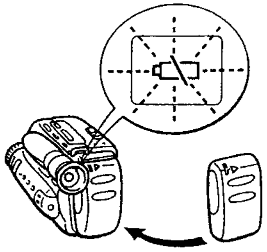
U-2



U-3



U-4



General

Use of the Battery Pack

How to Prepare the Rechargeable Battery Pack

Have sufficient battery pack power to do 2 or 3 times as much recording as is planned. U-1
"Battery life" as described in the instruction manual or catalogue of the video camera recorder is measured by the continuous recording time of the camera, placed in a room using a fully-charged battery.

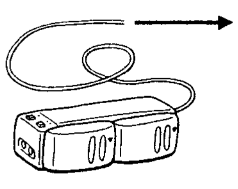
Battery life is shorter in a cold climate. U-2
Battery efficiency is decreased and battery life runs out more quickly.

While recording, turn the STANDBY switch of the camera on and off frequently. The battery life becomes longer. U-3
A smooth recording can be made even if recording is stopped and started again.
While positioning the subject or selecting an angle, or looking through the viewfinder lens, the lens moves automatically and the battery is being expended. The battery is also being expended when a cassette is inserted or removed.

When the Rechargeable Battery Pack Should be Replaced

While recording, when the mark ⌫ seen in the viewfinderr changes to rapid blinking from slow blinking. U-4
Turn off the power switch of the camera and replace the battery pack. Leave the cassette in the camera in order to obtain a smooth recording after the battery pack is replaced.

U-5



Use of the Battery Pack

Notes on Charging

Before using the battery pack, charge it sufficiently. The Sony rechargeable battery pack is placed on the market without having been charged. U-5

Recharge the battery pack when it is exhausted.

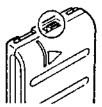
- If recording is completed before the mark 🔋 appears in the viewfinder, it is recommended that you use up the battery pack by running the tape in the playback mode or in the record mode with another cassette set in the camera, until the mark 🔋 blinks rapidly.
- Repeated charging while some capacity remains causes a lowering of battery capacity.

Recharge the battery pack just before using if possible.

Keep the Terminals Clean

If the terminals are not clean, the battery duration will be shortened.
When the terminals are not clean or when the battery pack has not been used for a long time, install and remove the battery pack from time to time. This will improve the contact condition.
Also, wipe the ⊕ and ⊖ terminals with a soft cloth or paper.

U-6



Use of the Battery Pack

Notes on Rechargeable Battery Pack

Why the battery pack heats up
During charging or recording, the battery pack heats up. This means that electric energy has been generated and that chemical change has occurred inside the battery pack. This is not dangerous.

When the charging is completed, remove the battery pack from the charger.
Within 24 hours after charging, remove the battery pack from the charger. Otherwise, overcharging may occur as an infinitesimal amount of current flows from the charger to the battery pack.

How to care for the battery pack

- Remove the battery pack from the video camera recorder after using it, and keep it in a cool place.
  When the battery pack is in the video camera recorder, an infinitesimal amount of current flows to the recorder even if the POWER switch is turned off. It causes overdischarging and shortens battery life.
- The battery pack is always discharging even when it is not in use after charging.
  Thus, it is recommended you charge the battery just before using.

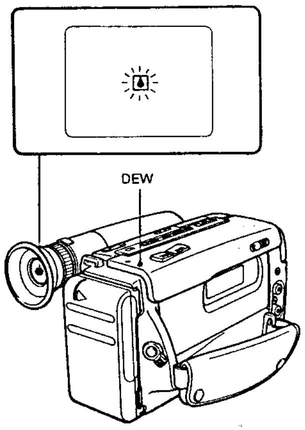
How to use the switch on the battery pack U-6
This switch is provided to show you the charging condition. Set the switch to the "no mark" position when the charging is completed. Set the switch to the "red mark" position when the battery is used up.

How many times can the battery pack be recharged
It can be fully charged and discharged about 500 times in normal temperature.
If the mark 🔋 blinks rapidly just after turning on the video camera recorder with a fully-charged battery pack, the battery pack should be replaced with a new fully-charged one.

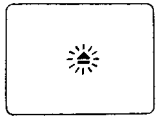
Temperatures during charging
Lower temperatures require a longer charging time.
Charging in temperatures ranging from 10°C to 30°C (5°F – 85°F) is recommended.

Carry the battery pack in a case.
Do not carry an uncovered battery pack.
If the + and – terminals of the battery pack are shortened by a piece of metal, the battery will be heated abnormally. This is very dangerous. Never put an uncovered battery pack in a pocket with a key holder, etc.

V-1



V-2



Notes on Moisture Condensation

If the unit is brought directly from a cold to a warm location, moisture may condense inside the unit, on the surface or the tape or on the lens. In this condition, the tape may adhere to the head drum and be damaged or the unit may not operate correctly. To prevent possible damage under these circumstances, the unit is furnished with moisture sensors.

Moisture is present inside the unit when: V-1

- The 💧 indicator blinks inside the viewfinder.
- The DEW lamp blinks on the recorder.

No function except for cassette ejection will work.

⬇

Eject the cassette if present, and turn off the unit and leave it with the cassette holder open at least for one hour.

⬇

The unit can be used again if the 💧 indicator does not appear when the power is turned on again.

If moisture is present on the surface of the tape V-2

When the tape is inserted and a tape transport button is pressed, the ⏏ indicator blinks inside the viewfinder. No function except for cassette ejection will work.

⬇

Eject the cassette and let the unit and the cassette sit at least for one hour.
The cassette can be used again if the ⏏ indicator does not appear when the cassette is inserted and a tape transport button is pressed.

If moisture condensation occurs on the lens
There are no caution indicators, but the lens becomes dim. Turn off the power and leave the unit unused at least for one hour.

Precautions

Operation

- Operate the unit on 6.0 V (battery pack), 7.5 V (AC power adaptor), 9.0 V (alkaline batteries).
- For DC or AC operation, use the accessories recommended in this manual.
- Should any solid object or liquid fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Do not hold the unit by the viewfinder.
- Avoid rough handling or mechanical shock to the unit. Be particularly careful of the lens.
- Do not apply excessive force to the microphone.
- Avoid shooting the same object for a long period of time (for example, using as a lookout camera or pointing the camera directly at the sun or other bright light sources) as this will damage the colour filter inside the camera and may cause a poor picture quality.
- Remove and store video cassettes after recording or playback.
- Do not wrap up the unit and operate it because heat may build up internally.
- Avoid using and storing the recorder in the following locations.
  - — Locations susceptible to vibration.
  - — Locations exposed to strong magnetic fields.
  - — Locations near TV or radio transmitters where strong radio waves are generated.
- Do not put the unit on the sand.

Care

- Store cassettes in their cases and keep them in an upright position to prevent intrusion of dust and uneven winding.
- When the unit will not be used for a long period of time, periodically turn on the power, operate the camera section and recorder section and play back a tape for about three minutes.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on them, remove them with a soft cloth. Clean the recorder body with a dry, soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.
For protection, keep the lens cap on the lens when not using the camera.

Using Your Recorder Abroad

Each country has special TV colour broadcast and electricity systems. Before using your recorder abroad, check the following points.

Differences in colour systems
If you prepare fully charged battery packs and the AC power adaptor which can be used in all areas with the local power supply of 100V – 240V, you can use your recorder in any country. You can monitor the playback picture on the viewfinder screen. However, to monitor the playback picture on a TV, the TV must be based on the PAL system and have the video/audio inputs.

PAL system countries
Australia, Austria, Belgium, China, Denmark, Finland, Great Britain, Holland, Hong Kong, Italy, Kuwait, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, West Germany, etc.

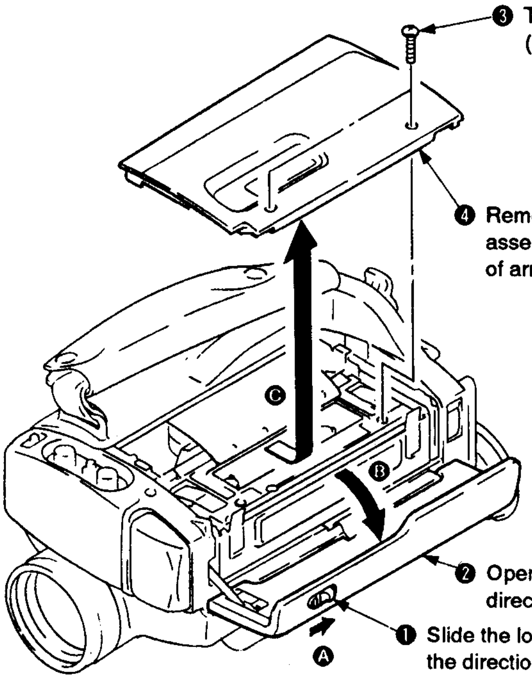
NTSC system countries
Bahama Islands, Canada, Central America, Japan, Korea, Mexico, Taiwan, the Philippines, U.S.A., etc.

SECAM system countries
Bulgaria, France, Hungary, Iran, Iraq, Monaco, Poland, the Soviet Union, etc.

Differences in cassette tapes
There are two formats for 8 mm video redording, PAL and NTSC. Video cassette tapes are made to correspond to the respective formats. Use PAL format cassette tape for the CCD-TR55E. You will find "P5" on the package of the cassette. In some countries, however, only NTSC format cassette tape with "P6" on the package is available. In this case, the standard recording times stipulated on the cassette are different from the actual recording time.

SECTION 2
DISASSEMBLY

2-1. REMOVAL OF CASSETTE LID ASSEMBLY



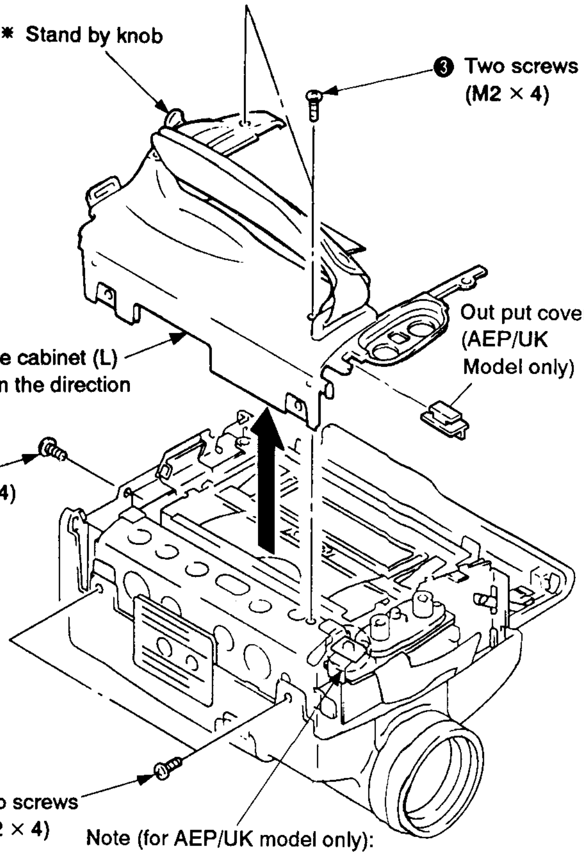
❸ Two screws (P1.4 × 5)

❹ Remove the cassette lid assembly in the direction of arrow Ⓒ.

❷ Open the grip lid in the direction of arrow Ⓑ.

❶ Slide the lock button in the direction of arrow Ⓐ.

2-3. REMOVAL OF CABINET (L) ASSEMBLY



* Stand by knob

❸ Two screws (M2 × 4)

Out put cove
(AEP/UK
Model only)

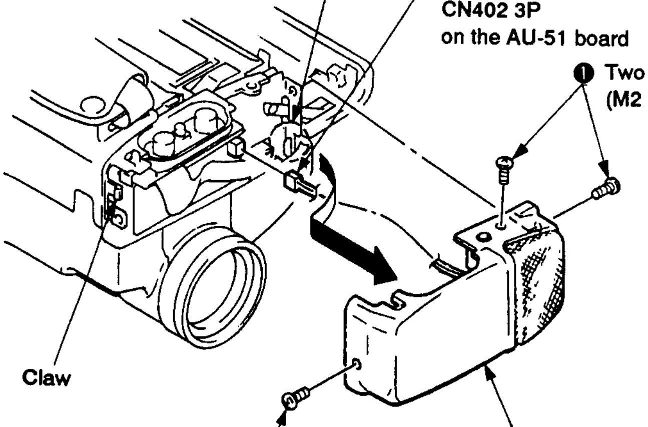
❹ Remove the cabinet (L) assembly in the direction of arrow.

❷ Screw (M2 × 4)

❶ Two screws (M2 × 4)

Note (for AEP/UK model only):
When installing the cabinet (L) assembly, set the switch knob to the left (drum side).

2-2. REMOVAL OF F PANEL BLOCK ASSEMBLY



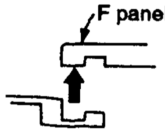
❹ Connector CN402 3P on the AU-51 board

❶ Two screws (M2 × 4)

❷ Screw (M2 × 4)

❸ Lift up the F panel block assembly a little and remove it in the direction of arrow. (Pay attention to the claw.)

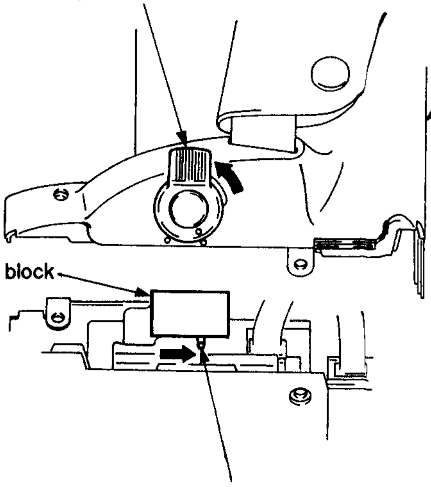
Details for Section Ⓐ



Remove F panel block assembly in the direction of the arrow from the concave portion of the main unit.

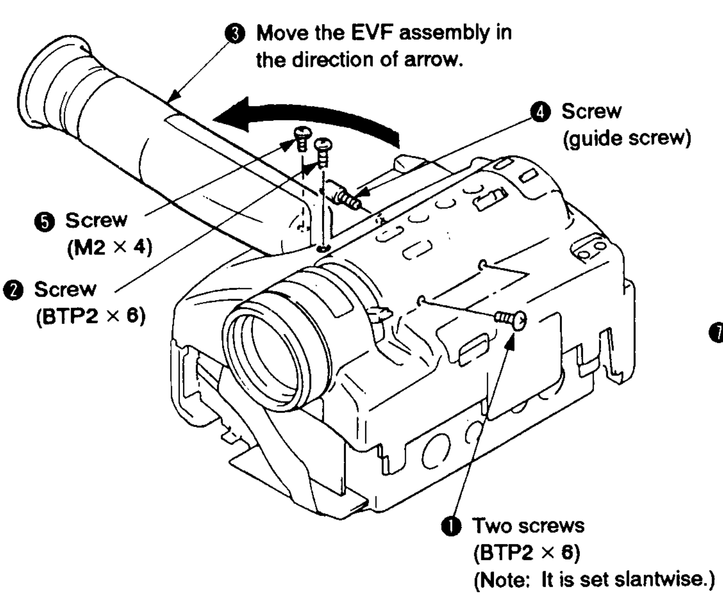
Note on installing the cabinet (L) assembly

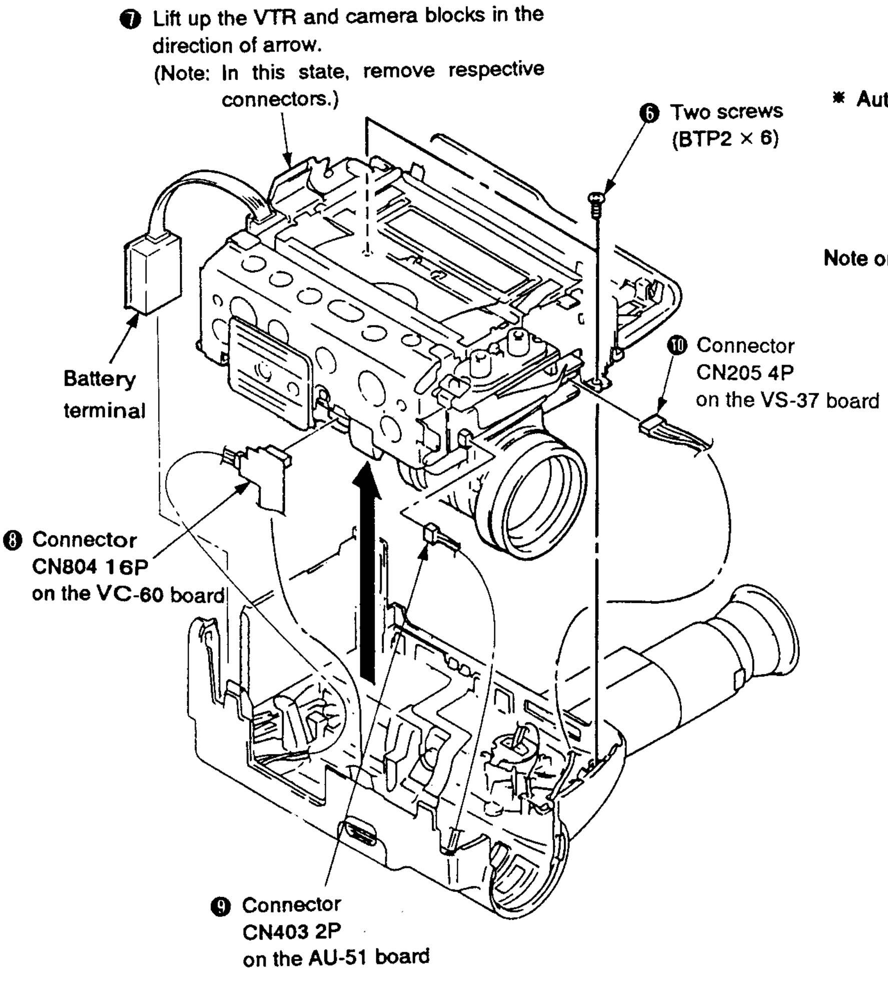
Set the stand by knob to "STAND BY" position.



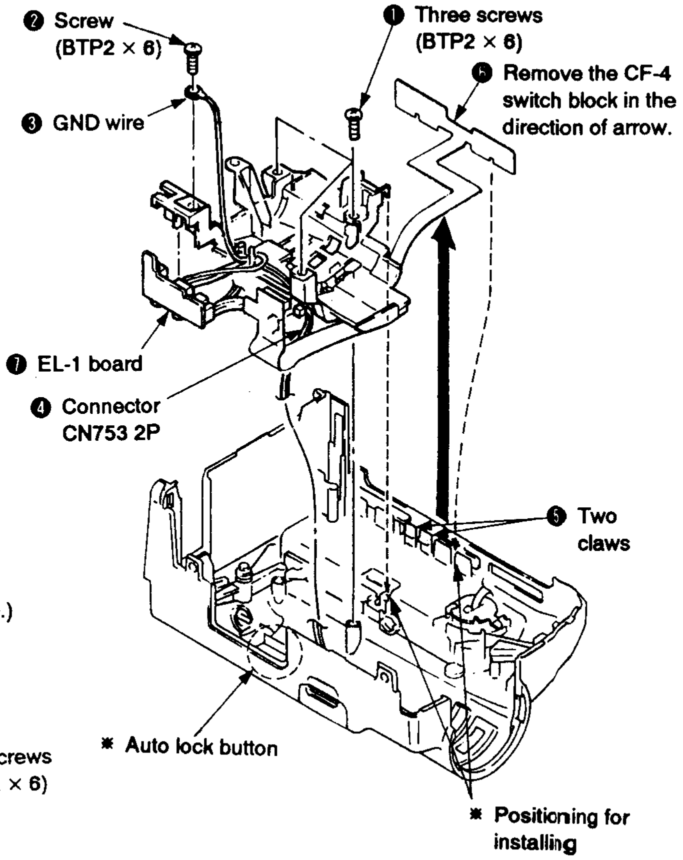
Slide the lock lever below the switch rightward.

2-4. REMOVAL OF VTR AND CAMERA BLOCKS


❸ Move the EVF assembly in the direction of arrow.
❹ Screw (guide screw)
❺ Screw (M2 × 4)
❷ Screw (BTP2 × 6)
❶ Two screws (BTP2 × 6) (Note: It is set slantwise.)

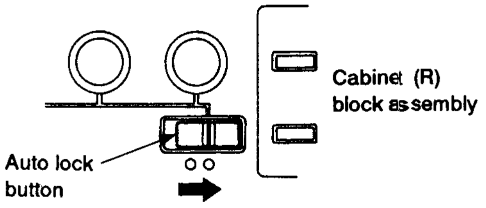

❼ Lift up the VTR and camera blocks in the direction of arrow. (Note: In this state, remove respective connectors.)
❻ Two screws (BTP2 × 6)
Battery terminal
❿ Connector CN205 4P on the VS-37 board
❽ Connector CN804 16P on the VC-60 board
❾ Connector CN403 2P on the AU-51 board

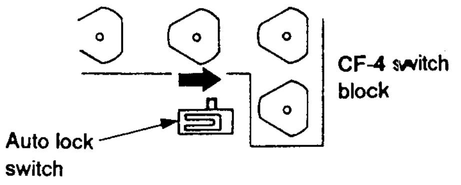
2-5. REMOVAL OF CF-4 SWITCH BLOCK


❷ Screw (BTP2 × 6)
❶ Three screws (BTP2 × 6)
❻ Remove the CF-4 switch block in the direction of arrow.
❸ GND wire
❼ EL-1 board
❹ Connector CN753 2P
❺ Two claws
* Auto lock button
* Positioning for installing

Note on installing CF-4 switch block

Set the auto lock button on the cabinet (R) block assembly to the rear (battery side) position.

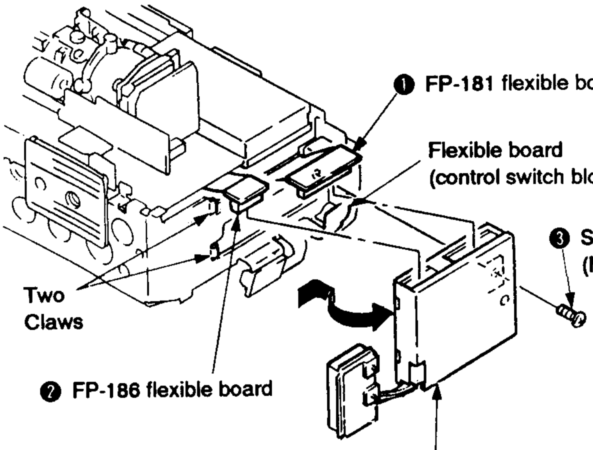

Cabinet (R) block assembly
Auto lock button


CF-4 switch block
Auto lock switch

Set the auto lock switch on the CF-4 switch block to the position indicated in the figure.

2-6. REMOVAL OF DC-DC CONVERTER UNIT

Note: Be sure to prevent the flexible board of the control switch block from being damaged when removing the DC-DC converter unit.



① FP-181 flexible board

Flexible board (control switch block)

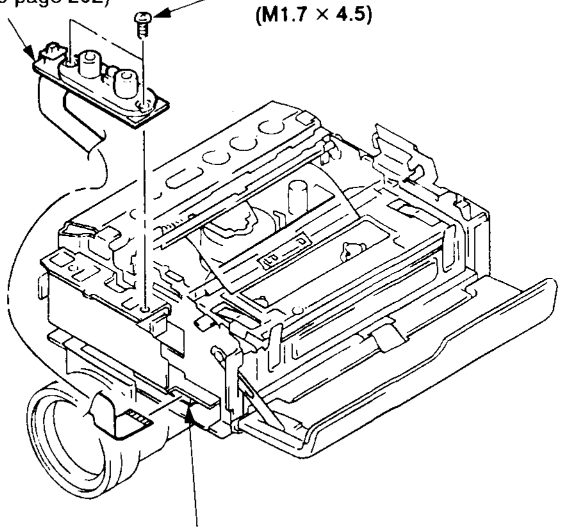
③ Screw (M2 × 3)

Two Claws

② FP-186 flexible board

④ Remove the DC-DC converter unit while releasing the two claws in the direction of arrow.

2-7. REMOVAL OF THE JK-40 BOARD

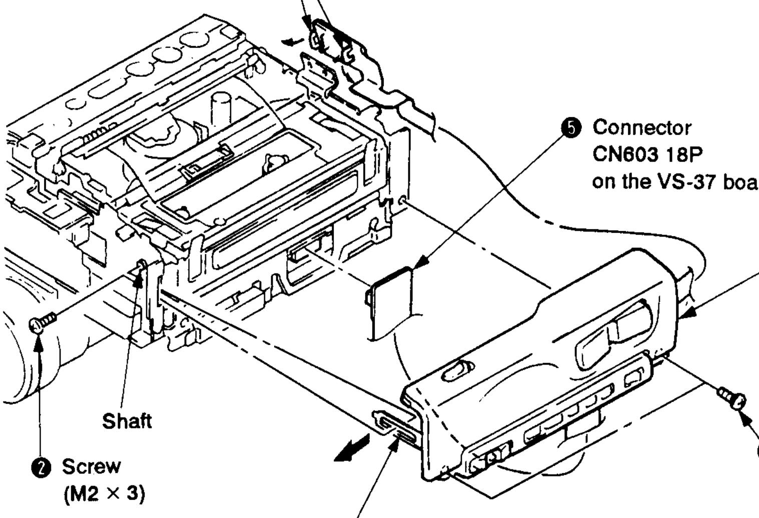


③ JK-40 board (Refer to page 202)

② Two screws (M1.7 × 4.5)

① Connector CN201 10P on the VS-37 board

2-8. REMOVAL OF CONTROL SWITCH BLOCK



① Remove two claws while opening in the direction of arrow.

⑤ Connector CN603 18P on the VS-37 board

⑥ Control switch block

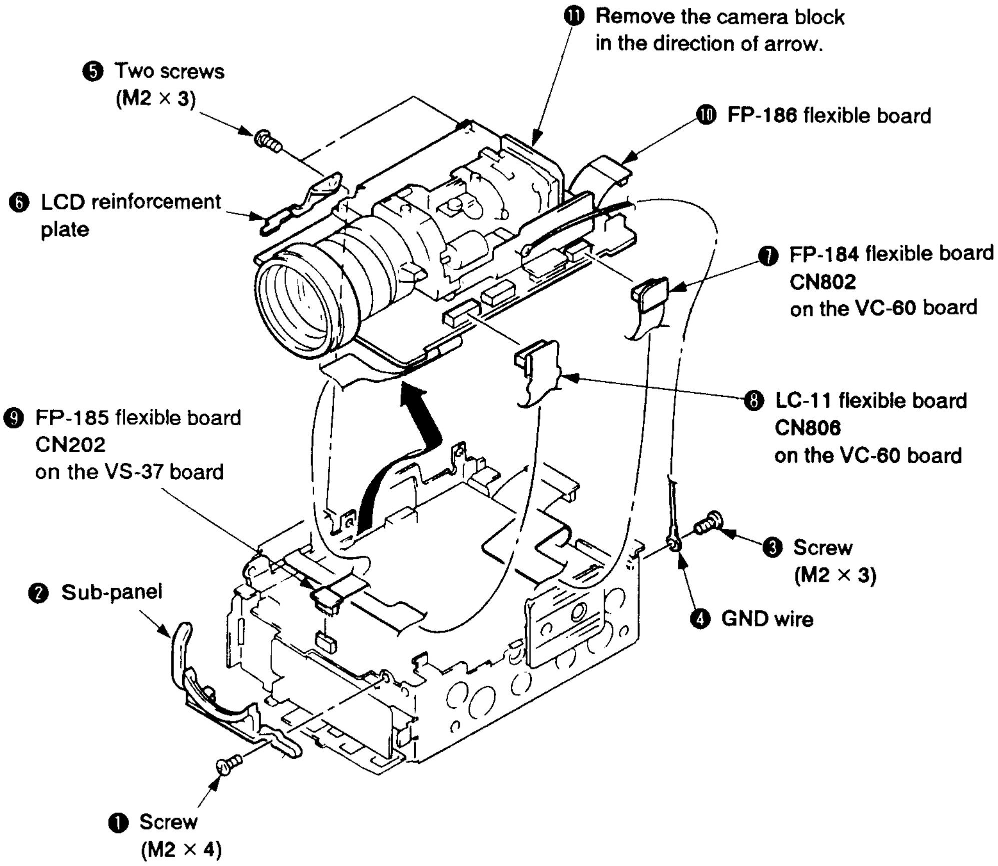
④ Two screws (M2 × 3)

Shaft

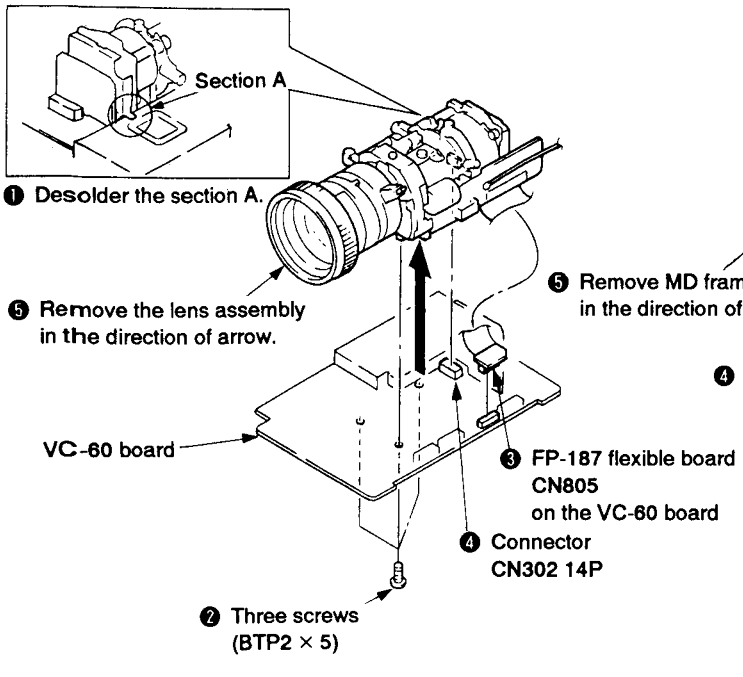
② Screw (M2 × 3)

③ Remove the lid lever from the shaft in the direction of arrow.

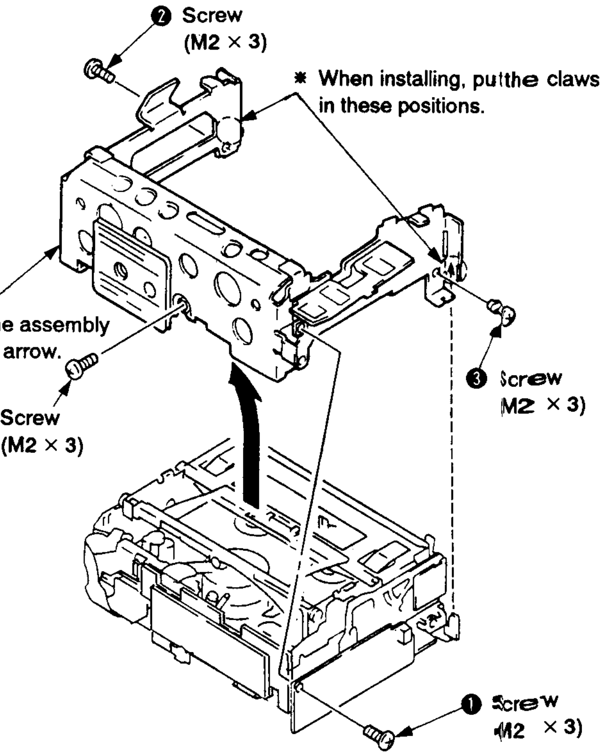
2-9. REMOVAL OF CAMERA BLOCK


❶ Remove the camera block in the direction of arrow.
❺ Two screws (M2 × 3)
❿ FP-186 flexible board
❻ LCD reinforcement plate
❼ FP-184 flexible board CN802 on the VC-60 board
❽ LC-11 flexible board CN806 on the VC-60 board
❾ FP-185 flexible board CN202 on the VS-37 board
❸ Screw (M2 × 3)
❷ Sub-panel
❹ GND wire
❶ Screw (M2 × 4)

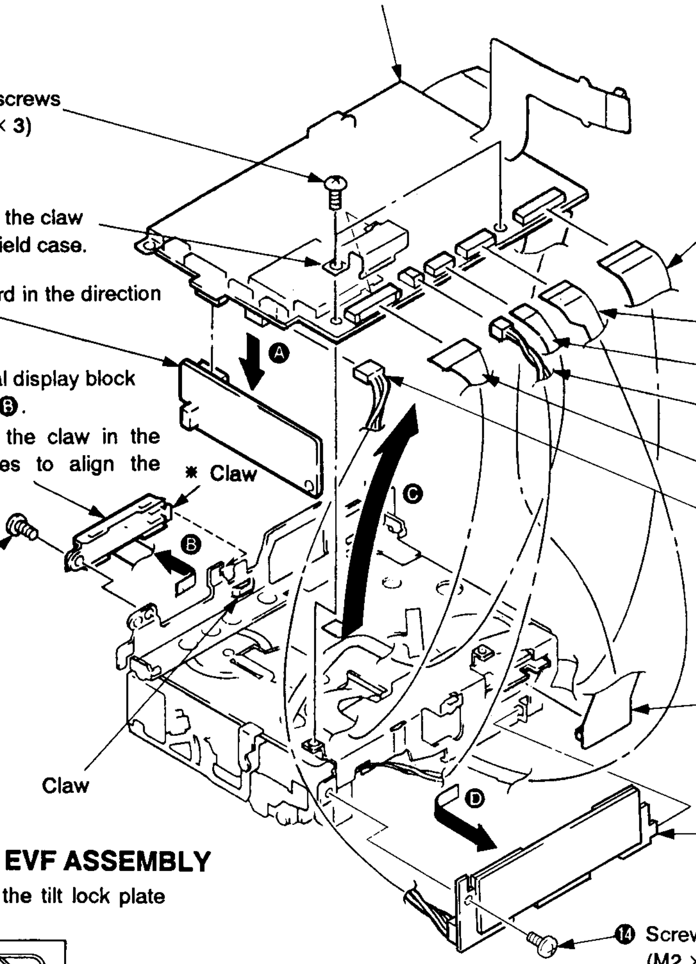
2-10. REMOVAL OF LENS ASSEMBLY


Section A
❶ Desolder the section A.
❺ Remove the lens assembly in the direction of arrow.
VC-60 board
❸ FP-187 flexible board CN805 on the VC-60 board
❹ Connector CN302 14P
❷ Three screws (BTP2 × 5)

2-11. REMOVAL OF MD FRAME ASSEMBLY


❷ Screw (M2 × 3)
* When installing, put the claws in these positions.
❺ Remove MD frame assembly in the direction of arrow.
❹ Screw (M2 × 3)
❸ Screw (M2 × 3)
❶ Screw (M2 × 3)

2-12. REMOVAL OF VS-37 BOARD



⑦ Remove the VS-37 board from the claw and open it in the direction of arrow Ⓒ.

⑤ Two screws (M2 × 3)

⑥ RP connector shield
* When installing, put the claw in the hole in the shield case.

① Remove the AU-51 board in the direction of arrow Ⓐ.

③ Remove the liquid crystal display block in the direction of arrow Ⓑ.
* When installing, put the claw in the notch on the chaises to align the position.

② Screw (M2 × 3)

④ FP-149 flexible board

⑨ DL-18 flexible board

⑩ FP-114 flexible board

⑪ Connector CN607 2P

⑫ Flexible connector (drum)

⑬ Connector CN206 4P

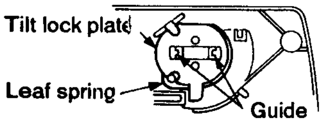
⑧ FP-182 flexible board

⑮ Remove the PD-18 board in the direction of arrow.

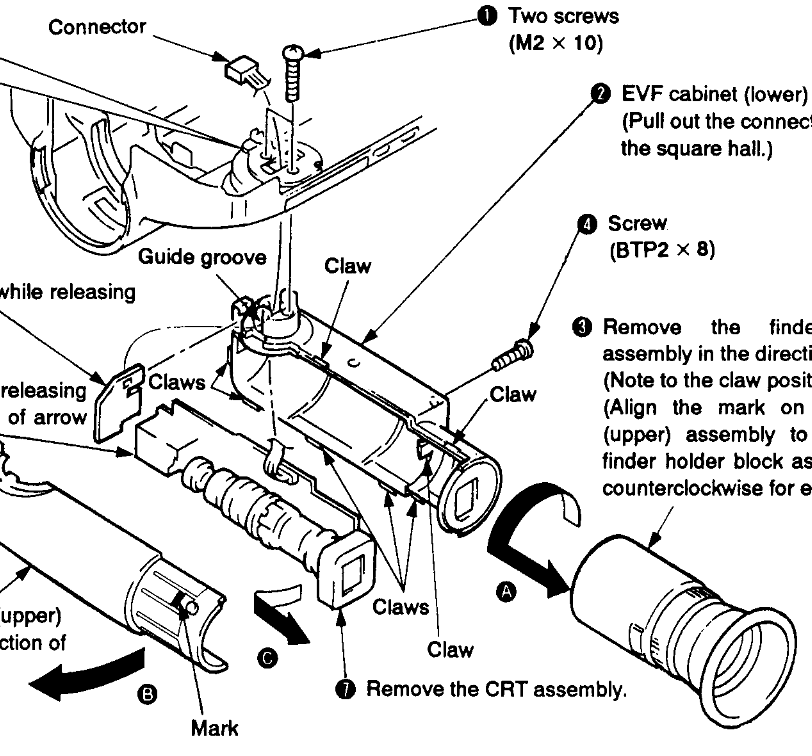
⑭ Screw (M2 × 3)

2-13. REMOVAL OF EVF ASSEMBLY

Installation after removing the tilt lock plate and leaf spring



※ Install the leaf spring and tilt lock plate in the seqquence to the cabinet (R) assembly (lock with the guide claw), and then insert the EVF assembly with its guide groove going along the cabinet (R) assembly guide.



① Two screws (M2 × 10)

② EVF cabinet (lower) assembly (Pull out the connector through the square hall.)

④ Screw (BTP2 × 8)

③ Remove the finder holder block assembly in the direction of arrow Ⓐ. (Note to the claw position.) (Align the mark on the EVF cabinet (upper) assembly to the edge of the finder holder block assembly and turn it counterclockwise for easy removal.)

⑥ Remove the TL-26 board while releasing it from the claw.

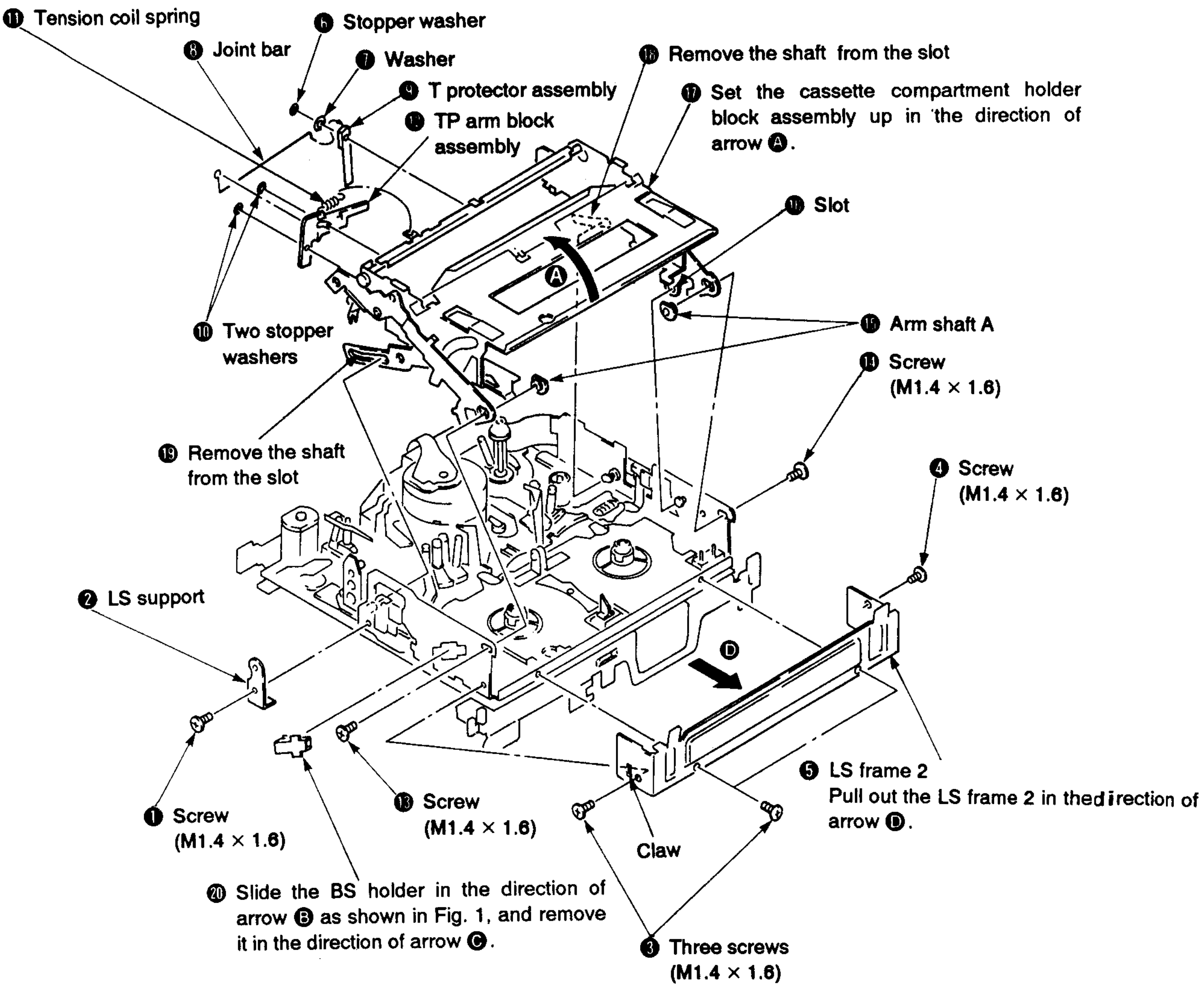
⑧ Remove the VF-19 board while releasing it from the claw in the direction of arrow Ⓒ.

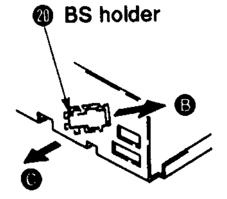
⑤ Pull the EVF cabinet (upper) assembly up in the direction of arrow Ⓑ.

⑦ Remove the CRT assembly.

2-14. REMOVAL OF CASSETTE COMPARTMENT HOLDER BLOCK ASSEMBLY

Set to USE mode first.
(As for setting to USE mode, refer to "1-4. OPERATION OF MODE SELECTOR" in "8 mm VIDEO MECHANISM BLOCK ADJUSTMENT MANUAL II FL MECHANISM (Q MECHANISM)".)


⑪ Tension coil spring
⑧ Joint bar
⑥ Stopper washer
⑦ Washer
⑨ T protector assembly
⑫ TP arm block assembly
⑯ Remove the shaft from the slot
⑰ Set the cassette compartment holder block assembly up in the direction of arrow Ⓐ.
Ⓐ
⑱ Slot
⑮ Arm shaft A
⑭ Screw
(M1.4 × 1.6)
⑩ Two stopper washers
⑲ Remove the shaft from the slot
④ Screw
(M1.4 × 1.6)
② LS support
Ⓓ
⑤ LS frame 2
Pull out the LS frame 2 in the direction of arrow Ⓓ.
① Screw
(M1.4 × 1.6)
⑬ Screw
(M1.4 × 1.6)
Claw
⑳ Slide the BS holder in the direction of arrow Ⓑ as shown in Fig. 1, and remove it in the direction of arrow Ⓒ.
③ Three screws
(M1.4 × 1.6)

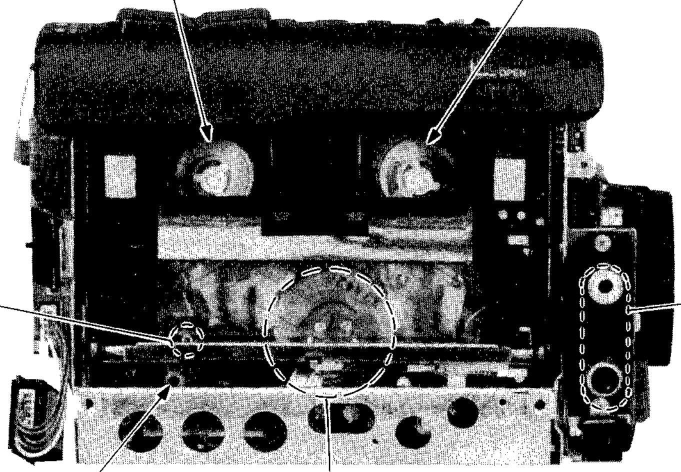


Note : **Be careful not to fall the compression coil spring and the steel bowl in the BS holder, when removing the BS holder.**

Fig. 1

2-15. INTERNAL VIEW

— Right Side —



T reel table assembly
X-3727-951-2

S reel table assembly
X-3727-952-1

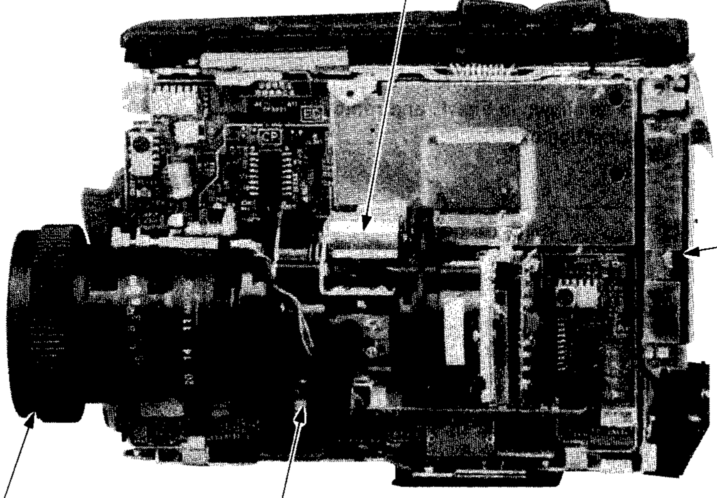
Pinch roller

J901
Pin jack 2P
(audio/video input/output)
1-537-142-11

M902
DC motor (capstan)
(U-21A)
8-835-329-01

M901
Drum assembly
(DGH-37A-R)

— Left Side —



M905
Focus/zoom motor
3-707-659-01

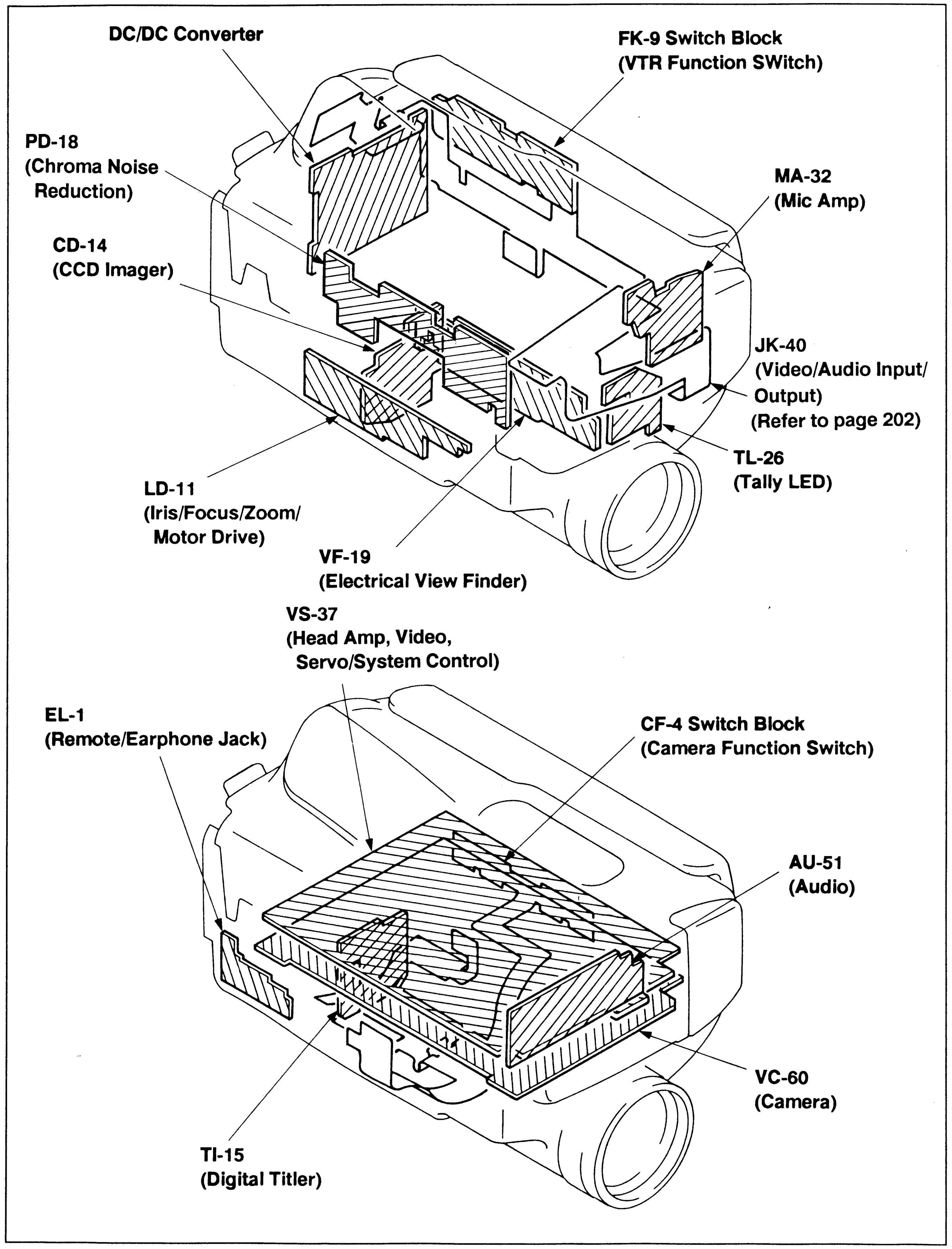
DC-DC converter unit
1-466-148-21

Zoom lens
(VCL-1106XA)
1-547-335-11

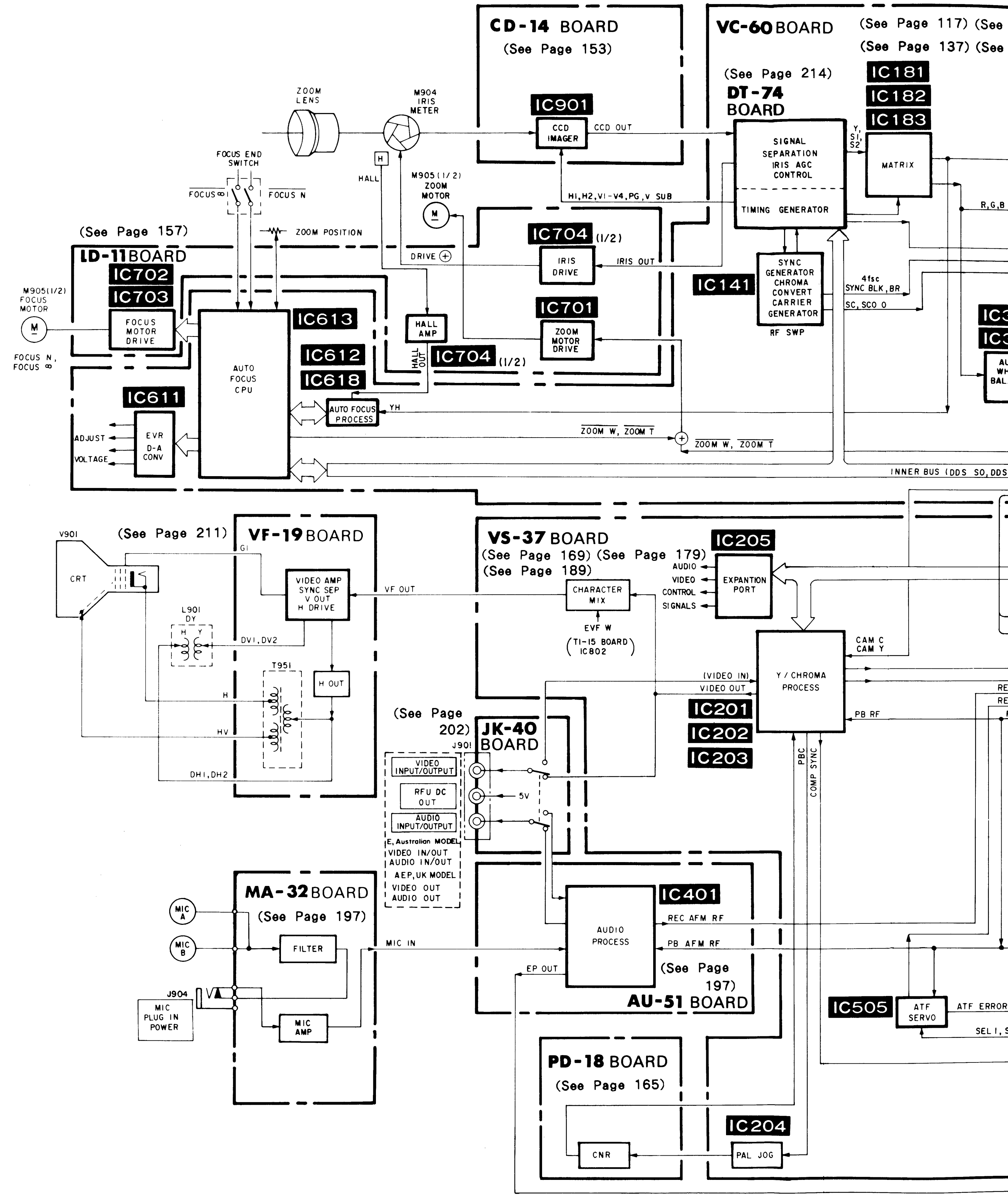
M904
Iris meter
3-707-660-01

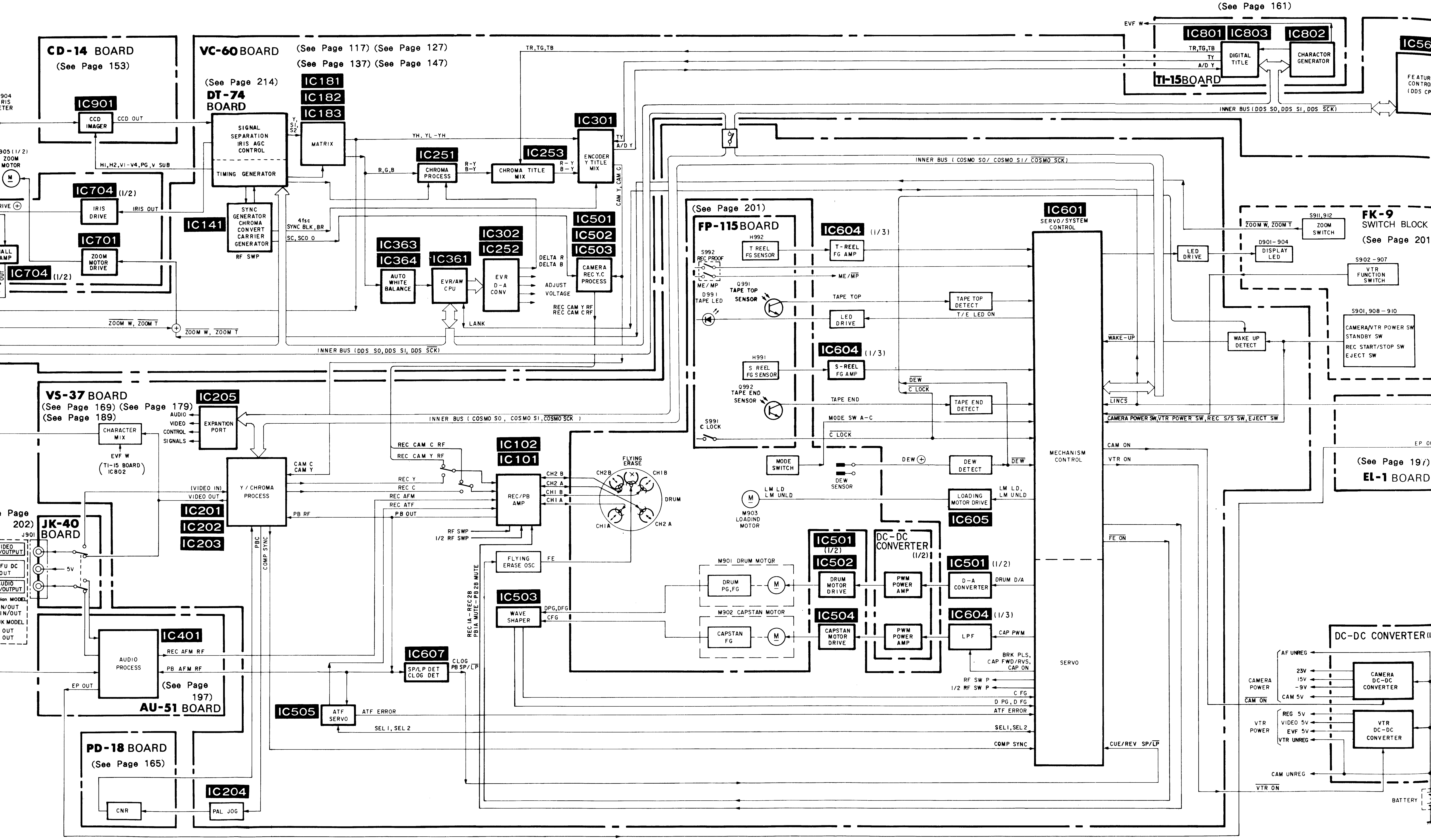
SECTION 3
DIAGRAMS

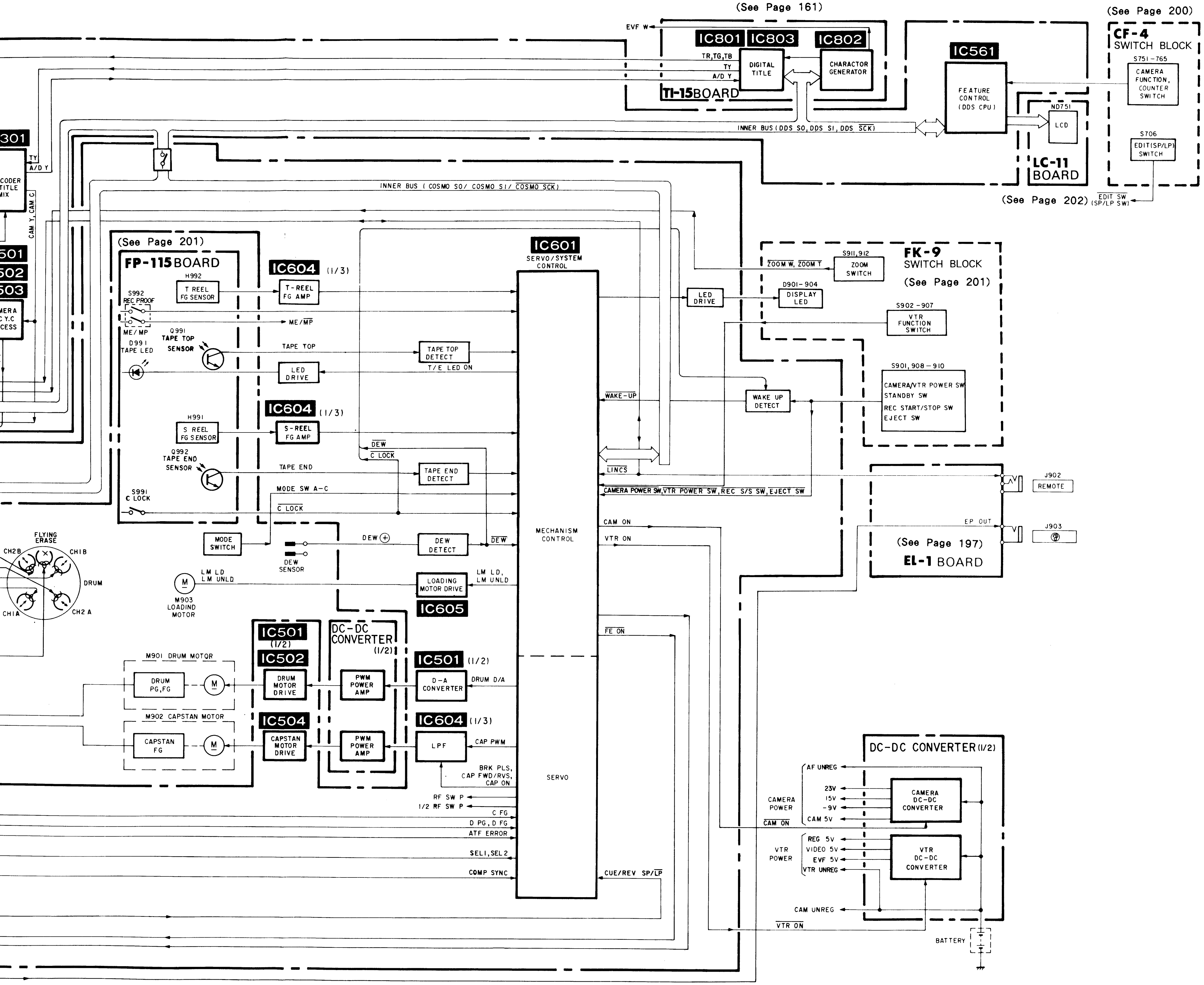
3-1. CIRCUIT BOARDS LOCATION


DC/DC Converter
FK-9 Switch Block
(VTR Function SWitch)
PD-18
(Chroma Noise
Reduction)
MA-32
(Mic Amp)
CD-14
(CCD Imager)
JK-40
(Video/Audio Input/
Output)
(Refer to page 202)
TL-26
(Tally LED)
LD-11
(Iris/Focus/Zoom/
Motor Drive)
VF-19
(Electrical View Finder)
VS-37
(Head Amp, Video,
Servo/System Control)
EL-1
(Remote/Earphone Jack)
CF-4 Switch Block
(Camera Function Switch)
AU-51
(Audio)
VC-60
(Camera)
TI-15
(Digital Titler)

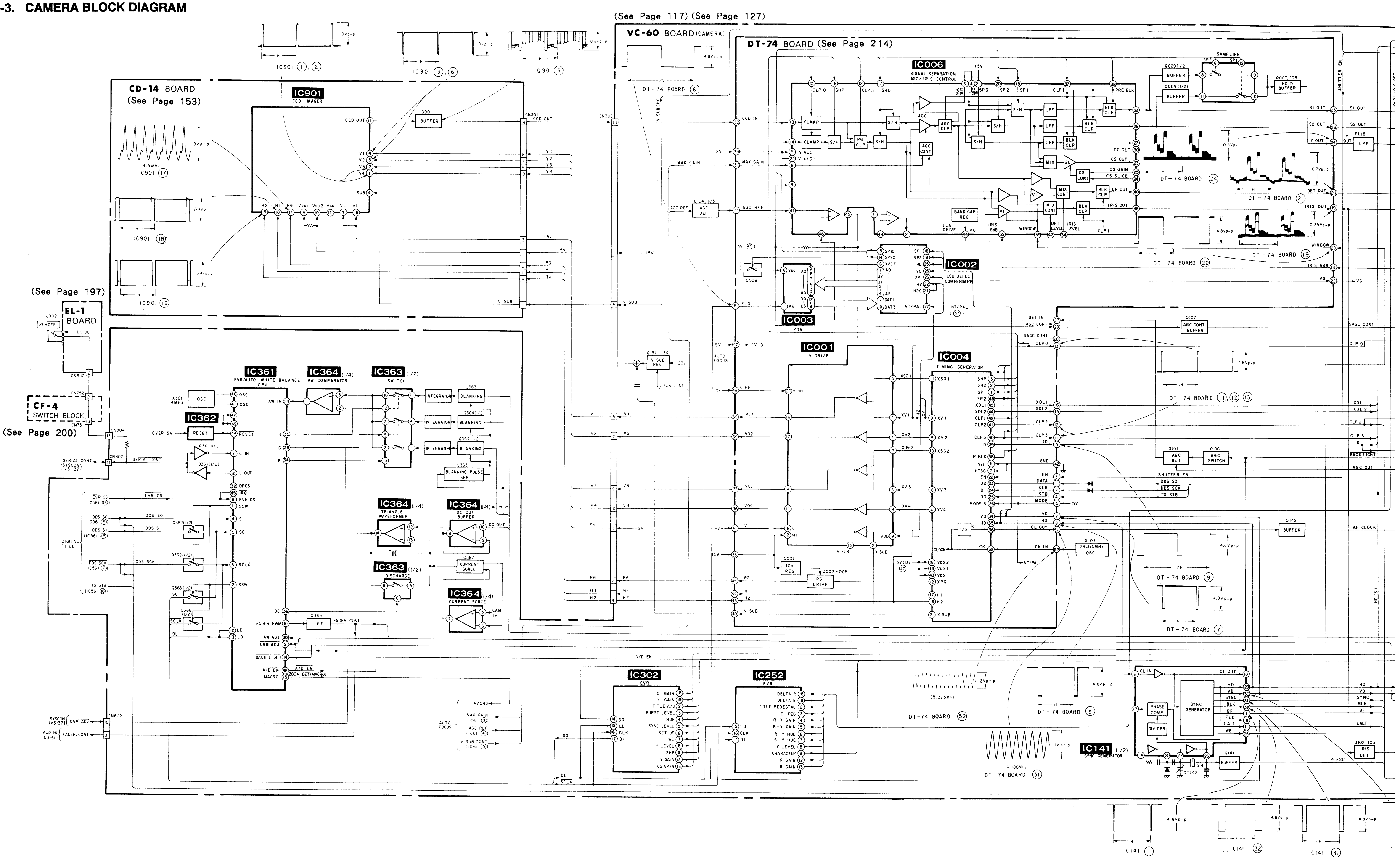
3-2. OVERALL BLOCK DIAGRAM


CD-14 BOARD
(See Page 153)
IC901
CCD IMAGER
CCD OUT
ZOOM LENS
M904 IRIS METER
HALL
H
M905 (1/2) ZOOM MOTOR
FOCUS END SWITCH
FOCUS ∞
FOCUS N
ZOOM POSITION
HI, H2, VI-V4, PG, V SUB
VC-60 BOARD
(See Page 117) (See
(See Page 137) (See
(See Page 214)
DT-74 BOARD
IC181
IC182
IC183
SIGNAL SEPARATION IRIS AGC CONTROL
TIMING GENERATOR
MATRIX
Y, S1, S2
R,G,B
(See Page 157)
LD-11 BOARD
IC702
IC703
M905 (1/2) FOCUS MOTOR
FOCUS MOTOR DRIVE
FOCUS N, FOCUS ∞
IC613
AUTO FOCUS CPU
IC612
IC618
IC611
EVR D-A CONV
ADJUST VOLTAGE
AUTO FOCUS PROCESS
YH
HALL AMP
HALL OUT
IC704 (1/2)
IC704 (1/2)
IRIS DRIVE
IRIS OUT
DRIVE
IC701
ZOOM MOTOR DRIVE
IC141
SYNC GENERATOR CHROMA CONVERT CARRIER GENERATOR
RF SWP
4fsc
SYNC BLK, BR
SC, SCO O
IC3
IC3
AU WH BAL
ZOOM W, ZOOM T
ZOOM W, ZOOM T
INNER BUS (DDS SO, DDS
V901
CRT
(See Page 211)
VF-19 BOARD
G1
VIDEO AMP SYNC SEP V OUT H DRIVE
VF OUT
L901 DY
H Y
DV1, DV2
T951
H OUT
H
HV
DH1, DH2
VS-37 BOARD
(See Page 169) (See Page 179)
(See Page 189)
IC205
AUDIO VIDEO CONTROL SIGNALS
EXPANTION PORT
CHARACTER MIX
EVF W
(TI-15 BOARD IC802)
CAM C
CAM Y
(VIDEO IN)
VIDEO OUT
Y / CHROMA PROCESS
IC201
IC202
IC203
PB RF
RE
RE
PBC
COMP SYNC
(See Page 202)
JK-40 BOARD
J901
VIDEO INPUT/OUTPUT
RFU DC OUT
AUDIO INPUT/OUTPUT
5V
E, Australian MODEL
VIDEO IN/OUT
AUDIO IN/OUT
AEP, UK MODEL
VIDEO OUT
AUDIO OUT
MA-32 BOARD
(See Page 197)
MIC A
MIC B
FILTER
MIC IN
J904
MIC PLUG IN POWER
MIC AMP
IC401
AUDIO PROCESS
REC AFM RF
PB AFM RF
EP OUT
(See Page 197)
AU-51 BOARD
IC505
ATF SERVO
ATF ERROR
SEL 1, S
PD-18 BOARD
(See Page 165)
CNR
IC204
PAL JOG

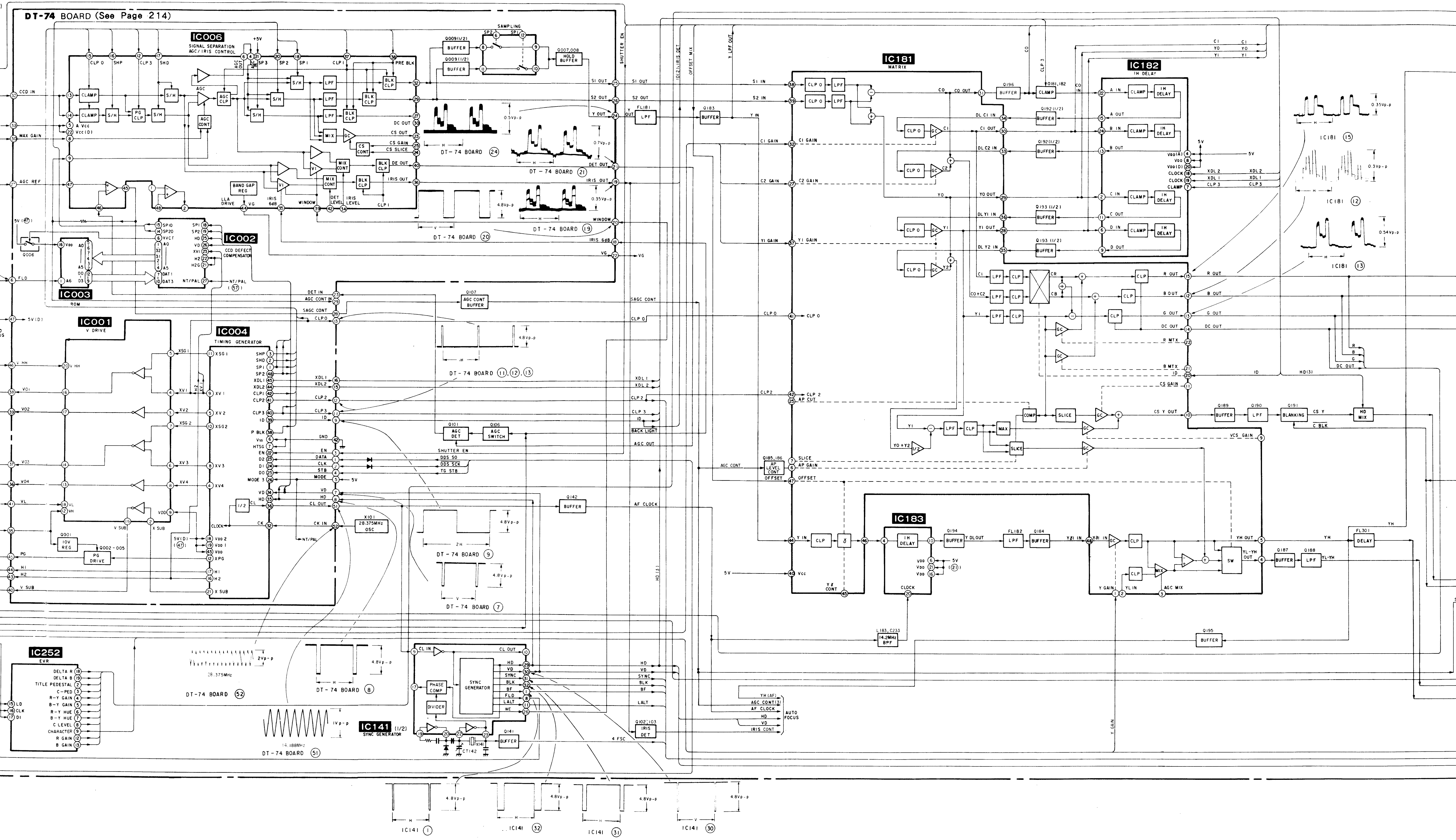

CD-14 BOARD
(See Page 153)
IC901
CCD IMAGER
CCD OUT
VC-60 BOARD
(See Page 117) (See Page 127)
(See Page 137) (See Page 147)
(See Page 214)
DT-74 BOARD
SIGNAL SEPARATION IRIS AGC CONTROL
TIMING GENERATOR
IC181
IC182
IC183
MATRIX
Y, S1, S2
YH, YL-YH
IC301
ENCODER Y TITLE MIX
TY
A/D Y
TR,TG,TB
IC251
CHROMA PROCESS
IC253
CHROMA TITLE MIX
R-Y
B-Y
R,G,B
HI,H2,VI-V4,PG,V SUB
IC704 (1/2)
IRIS DRIVE
IRIS OUT
IC701
ZOOM MOTOR DRIVE
IC704 (1/2)
IC141
SYNC GENERATOR CHROMA CONVERT CARRIER GENERATOR
RF SWP
4fsc SYNC BLK,BR
SC, SCO 0
IC363
IC364
AUTO WHITE BALANCE
IC361
EVR/AW CPU
IC302
IC252
EVR D-A CONV
DELTA R
DELTA B
ADJUST VOLTAGE
IC501
IC502
IC503
CAMERA REC Y.C PROCESS
REC CAM Y RF
REC CAM C RF
CAM Y, CAM C
LANK
ZOOM W, ZOOM T
INNER BUS (DDS SO, DDS SI, DDS SCK)
905 (1/2) ZOOM MOTOR
904 IRIS METER
DRIVE
ALL AMP
(See Page 161)
EVF W
IC801
IC803
IC802
DIGITAL TITLE
CHARACTOR GENERATOR
TR,TG,TB
TY
A/D Y
TI-15 BOARD
IC56
FEATUR CONTRO (DDS CP
INNER BUS (DDS SO, DDS SI, DDS SCK)
INNER BUS (COSMO SO/ COSMO SI/ COSMO SCK)
(See Page 201)
FP-115 BOARD
H992
T REEL FG SENSOR
IC604 (1/3)
T-REEL FG AMP
S992 REC PROOF
ME/MP
Q991 TAPE TOP SENSOR
D991 TAPE LED
TAPE TOP
TAPE TOP DETECT
T/E LED ON
LED DRIVE
H991
S REEL FG SENSOR
IC604 (1/3)
S-REEL FG AMP
Q992 TAPE END SENSOR
TAPE END
TAPE END DETECT
DEW
C LOCK
S991 C LOCK
MODE SW A-C
C LOCK
MODE SWITCH
DEW
DEW SENSOR
DEW DETECT
M903 LOADIND MOTOR
LM LD
LM UNLD
LOADING MOTOR DRIVE
IC605
IC601
SERVO/SYSTEM CONTROL
MECHANISM CONTROL
SERVO
WAKE-UP
LINCS
CAMERA POWER SW, VTR POWER SW, REC S/S SW, EJECT SW
CAM ON
VTR ON
FE ON
CUE/REV SP/LP
LED DRIVE
FK-9 SWITCH BLOCK
(See Page 201)
S911,912
ZOOM SWITCH
ZOOM W, ZOOM T
D901-904
DISPLAY LED
S902-907
VTR FUNCTION SWITCH
S901, 908-910
CAMERA/VTR POWER SW
STANDBY SW
REC START/STOP SW
EJECT SW
WAKE UP DETECT
EP OUT
(See Page 197)
EL-1 BOARD
VS-37 BOARD
(See Page 169) (See Page 179)
(See Page 189)
CHARACTER MIX
EVF W
(TI-15 BOARD IC802)
IC205
EXPANTION PORT
AUDIO
VIDEO
CONTROL
SIGNALS
INNER BUS (COSMO SO, COSMO SI, COSMO SCK)
Y/CHROMA PROCESS
CAM C
CAM Y
(VIDEO IN)
VIDEO OUT
PB RF
IC201
IC202
IC203
PBC
COMP SYNC
REC CAM C RF
REC CAM Y RF
REC Y
REC C
REC AFM
REC ATF
PB OUT
IC102
IC101
REC/PB AMP
RF SWP
1/2 RF SWP
CH2 B
CH2 A
CH1 B
CH1 A
FLYING ERASE
DRUM
CH2B
CH1B
CH1A
CH2A
FLYING ERASE OSC
FE
IC503
WAVE SHAPER
DPG,DFG
CFG
REC 1A-REC 2B
PB 1A MUTE-PB 2B MUTE
Page 202)
JK-40 BOARD
J901
VIDEO IN/OUTPUT
FU DC OUT
AUDIO IN/OUTPUT
5V
IC401
AUDIO PROCESS
REC AFM RF
PB AFM RF
(See Page 197)
AU-51 BOARD
EP OUT
IC607
SP/LP DET CLOG DET
CLOG
PB SP/LP
IC505
ATF SERVO
ATF ERROR
SEL 1, SEL 2
PD-18 BOARD
(See Page 165)
IC204
CNR
PAL JOG
M901 DRUM MOTOR
DRUM PG,FG
M
M902 CAPSTAN MOTOR
CAPSTAN FG
IC501 (1/2)
IC502
DRUM MOTOR DRIVE
IC504
CAPSTAN MOTOR DRIVE
DC-DC CONVERTER (1/2)
PWM POWER AMP
PWM POWER AMP
IC501 (1/2)
D-A CONVERTER
DRUM D/A
IC604 (1/3)
LPF
CAP PWM
BRK PLS, CAP FWD/RVS, CAP ON
RF SW P
1/2 RF SW P
C FG
D PG, D FG
ATF ERROR
SEL1, SEL2
COMP SYNC
DC-DC CONVERTER
AF UNREG
23V
15V
-9V
CAM 5V
CAMERA POWER
CAM ON
CAMERA DC-DC CONVERTER
REG 5V
VIDEO 5V
EVF 5V
VTR UNREG
VTR POWER
VTR DC-DC CONVERTER
CAM UNREG
VTR ON
BATTERY


(See Page 161)
EVF W
IC801
IC803
IC802
TR,TG,TB
TY
A/D Y
DIGITAL TITLE
CHARACTOR GENERATOR
TI-15 BOARD
IC561
FEATURE CONTROL (DDS CPU)
INNER BUS (DDS SO, DDS SI, DDS SCK)
ND751
LCD
LC-11 BOARD
(See Page 202)
(See Page 200)
CF-4 SWITCH BLOCK
S751-765
CAMERA FUNCTION, COUNTER SWITCH
S706
EDIT(SP/LP) SWITCH
EDIT SW (SP/LP SW)
301
TY
A/D Y
CODER TITLE MIX
CAM Y, CAM C
501
502
503
MERA Y.C CESS
INNER BUS (COSMO SO/ COSMO SI/ COSMO SCK)
(See Page 201)
FP-115 BOARD
H992
T REEL FG SENSOR
S992 REC PROOF
ME/MP
Q991 TAPE TOP SENSOR
D991 TAPE LED
IC604 (1/3)
T-REEL FG AMP
ME/MP
TAPE TOP
TAPE TOP DETECT
T/E LED ON
LED DRIVE
H991
S REEL FG SENSOR
IC604 (1/3)
S-REEL FG AMP
Q992 TAPE END SENSOR
TAPE END
TAPE END DETECT
DEW
C LOCK
MODE SW A-C
S991 C LOCK
C LOCK
IC601
SERVO/SYSTEM CONTROL
MECHANISM CONTROL
SERVO
LED DRIVE
WAKE-UP
WAKE UP DETECT
LINCS
CAMERA POWER SW, VTR POWER SW, REC S/S SW, EJECT SW
CAM ON
VTR ON
FE ON
CUE/REV SP/LP
FK-9 SWITCH BLOCK
(See Page 201)
ZOOM W, ZOOM T
S911,912
ZOOM SWITCH
D901-904
DISPLAY LED
S902-907
VTR FUNCTION SWITCH
S901, 908-910
CAMERA/VTR POWER SW
STANDBY SW
REC START/STOP SW
EJECT SW
J902
REMOTE
EP OUT
J903
(See Page 197)
EL-1 BOARD
FLYING ERASE
CH2B
CH1B
DRUM
CH1A
CH2 A
MODE SWITCH
DEW SENSOR
DEW
DEW DETECT
LM LD
LM UNLD
M903 LOADIND MOTOR
LOADING MOTOR DRIVE
IC605
LM LD, LM UNLD
IC501 (1/2)
IC502
DC-DC CONVERTER (1/2)
M901 DRUM MOTOR
DRUM PG,FG
DRUM MOTOR DRIVE
PWM POWER AMP
IC501 (1/2)
D-A CONVERTER
DRUM D/A
M902 CAPSTAN MOTOR
CAPSTAN FG
IC504
CAPSTAN MOTOR DRIVE
PWM POWER AMP
IC604 (1/3)
LPF
CAP PWM
BRK PLS, CAP FWD/RVS, CAP ON
RF SW P
1/2 RF SW P
C FG
D PG, D FG
ATF ERROR
SEL1, SEL2
COMP SYNC
DC-DC CONVERTER (1/2)
AF UNREG
23V
15V
-9V
CAM 5V
CAMERA POWER
CAM ON
CAMERA DC-DC CONVERTER
REG 5V
VIDEO 5V
EVF 5V
VTR UNREG
VTR POWER
VTR DC-DC CONVERTER
CAM UNREG
VTR ON
BATTERY

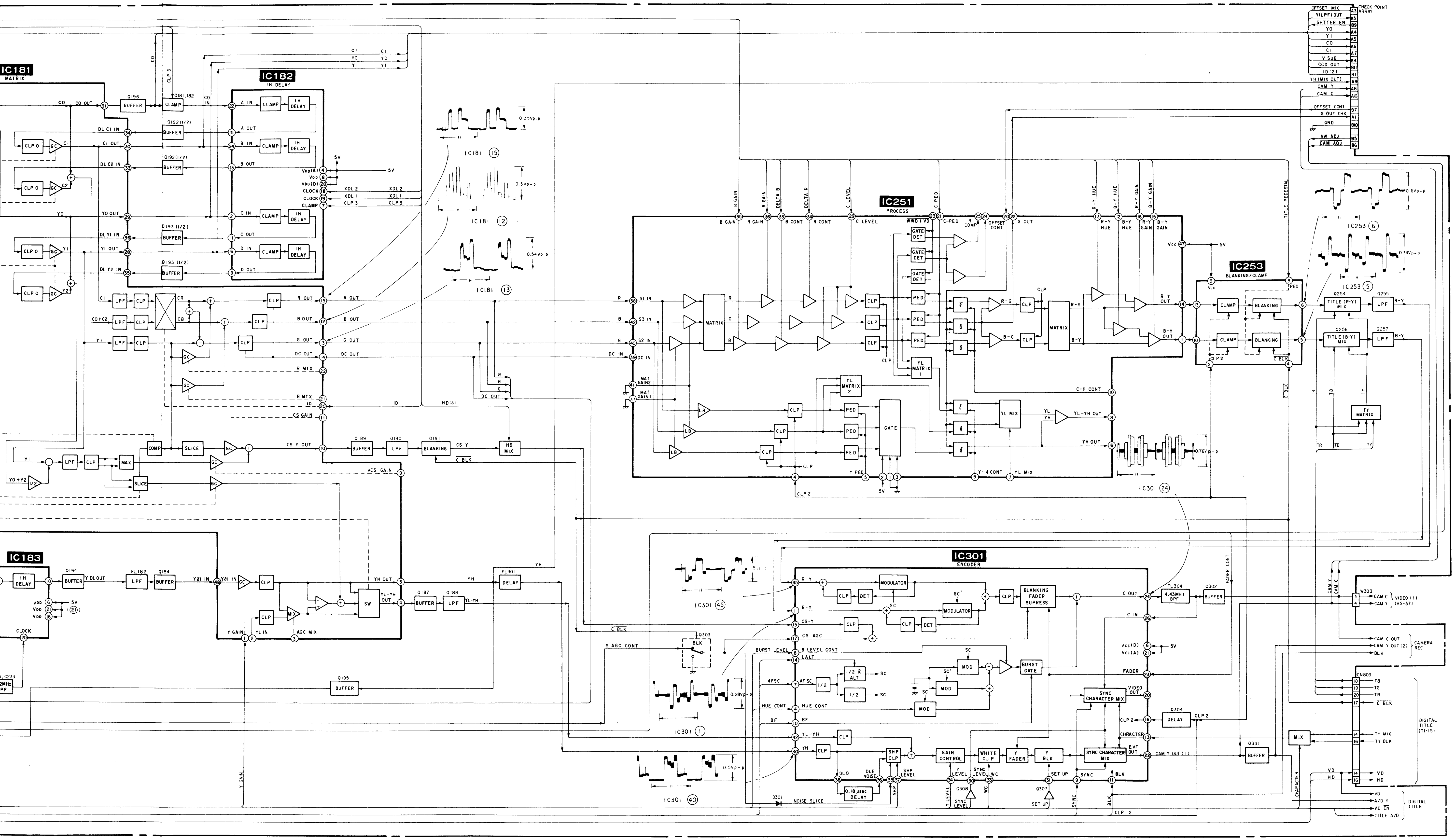
3-3. CAMERA BLOCK DIAGRAM


(See Page 117) (See Page 127)
VC-60 BOARD (CAMERA)
DT-74 BOARD (See Page 214)
CD-14 BOARD (See Page 153)
IC901 CCD IMAGER
Q901 BUFFER
CCD OUT
V1 V2 V3 V4
SUB
H2 H1 PG VDD1 VDD2 VGG VL VL
9.5MHz IC901 (17)
IC901 (18)
IC901 (19)
IC901 (1),(2)
IC901 (3),(6)
Q901 (5)
9Vp-p
6.4Vp-p
0.6Vp-p
4.8Vp-p
(See Page 197)
EL-1 BOARD
J902 REMOTE
DC OUT
CN942
CF-4 SWITCH BLOCK
(See Page 200)
CN752
CN751
CN804
CN802
SERIAL CONT (SYSCON) (VS-37)
SYSCON (VS-37) CAM ADJ
AUD 16 (AU-51) FADER CONT
IC361 EVR/AUTO WHITE BALANCE CPU
IC362 RESET
X361 4MHz OSC
EVER 5V
IC364 (1/4) AW COMPARATOR
IC363 (1/2) SWITCH
INTEGRATOR
BLANKING
Q363
Q364 (1/2)
Q365 BLANKING PULSE SEP
IC364 (1/4) TRIANGLE WAVEFORMER
IC364 (1/4) DC OUT BUFFER
IC363 (1/2) DISCHARGE
Q367 CURRENT SORCE
IC364 (1/4) CURRENT SORCE
CAM IV
Q369 LPF
FADER PWM
FADER CONT
AW ADJ
CAM ADJ
BACK LIGHT
A/D EN
MACRO
ZOOM DET (MACRO)
DIGITAL TITLE
EVR CS (IC561 (3))
DDS SC (IC561 (6))
DDS SI (IC561 (5))
DDS SCK (IC561 (7))
TG STB (IC561 (6))
Q361 (1/2)
Q362 (1/2)
Q368 (1/2)
DL
SCLK
SO
AUTO FOCUS
MACRO
MAX GAIN (IC611 (3))
AGC REF (IC611 (4))
V SUB CONT (IC611 (5))
IC3C2 EVR
C1 GAIN
Y1 GAIN
TITLE A/D
BURST LEVEL
HUE
SYNC LEVEL
SET UP
WC
Y LEVEL
SHP
Y GAIN
C2 GAIN
IC252 EVR
DELTA R
DELTA B
TITLE PEDESTAL
C-PED
R-Y GAIN
B-Y GAIN
R-Y HUE
B-Y HUE
C LEVEL
CHARACTER
R GAIN
B GAIN
DT-74 BOARD (6)
V SUB
Q131-134 V SUB REG
V SUB CONT
MAX GAIN
AGC REF
Q104, 105 AGC DEF
IC006 SIGNAL SEPARATION AGC/IRIS CONTROL
CLP0 SHP CLP3 SHD
CCD IN
CLAMP
S/H
PG CLP
AGC
AGC CLP
AGC CONT
LPF
BLK CLP
PRE BLK
MIX
CS CONT
CS OUT
CS GAIN
CS SLICE
DE OUT
MIX CONT
IRIS OUT
BAND GAP REG
LLA DRIVE
IRIS 6dB
WINDOW
DET LEVEL
IRIS LEVEL
DC OUT
Q009 (1/2) BUFFER
SAMPLING
Q007, 008 HOLD BUFFER
S1 OUT
S2 OUT
Y OUT
FL181 LPF
DET OUT
IRIS OUT
WINDOW
IRIS 6dB
VG
SHUTTER EN
DT-74 BOARD (24)
DT-74 BOARD (21)
DT-74 BOARD (20)
DT-74 BOARD (19)
0.5Vp-p
0.7Vp-p
0.35Vp-p
Q006
IC003 ROM
IC002 CCD DEFECT COMPENSATOR
SP1 SP2 HD VD XV1 H2 H2G
NT/PAL
FLD
IC001 V DRIVE
IC004 TIMING GENERATOR
XSG1 XV1 XV2 XSG2 XV3 XV4
SHP SHD SP1 SP2 XDL1 XDL2 CLP1 CLP2 CLP3 ID
P BLK VSS HTSG EN D2 D1 D0 MODE 3
VD HD CL OUT CK
VDD2 VDD1 VDD XPG
H1 H2 X SUB
Q001 10V REG
Q002-005 PG DRIVE
1/2
X101 28.375MHz OSC
DET IN
AGC CONT
SAGC CONT
CLP0
Q107 AGC CONT BUFFER
Q101 AGC DET
Q106 AGC SWITCH
SHUTTER EN
DDS SO
DDS SCK
TG STB
Q142 BUFFER
AF CLOCK
XDL1 XDL2 CLP2 CLP3 ID
BACK LIGHT
AGC OUT
DT-74 BOARD (11),(12),(13)
DT-74 BOARD (9)
DT-74 BOARD (7)
DT-74 BOARD (8)
DT-74 BOARD (52)
28.375MHz
2Vp-p
DT-74 BOARD (51)
14.188MHz
1Vp-p
IC141 (1/2) SYNC GENERATOR
CL IN
CL OUT
PHASE COMP
DIVIDER
SYNC GENERATOR
HD VD SYNC BLK BF FLD LALT WE
X141
CT142
Q141 BUFFER
Q102, 103 IRIS DET
4 FSC
IC141 (1)
IC141 (32)
IC141 (31)
2H
H
V

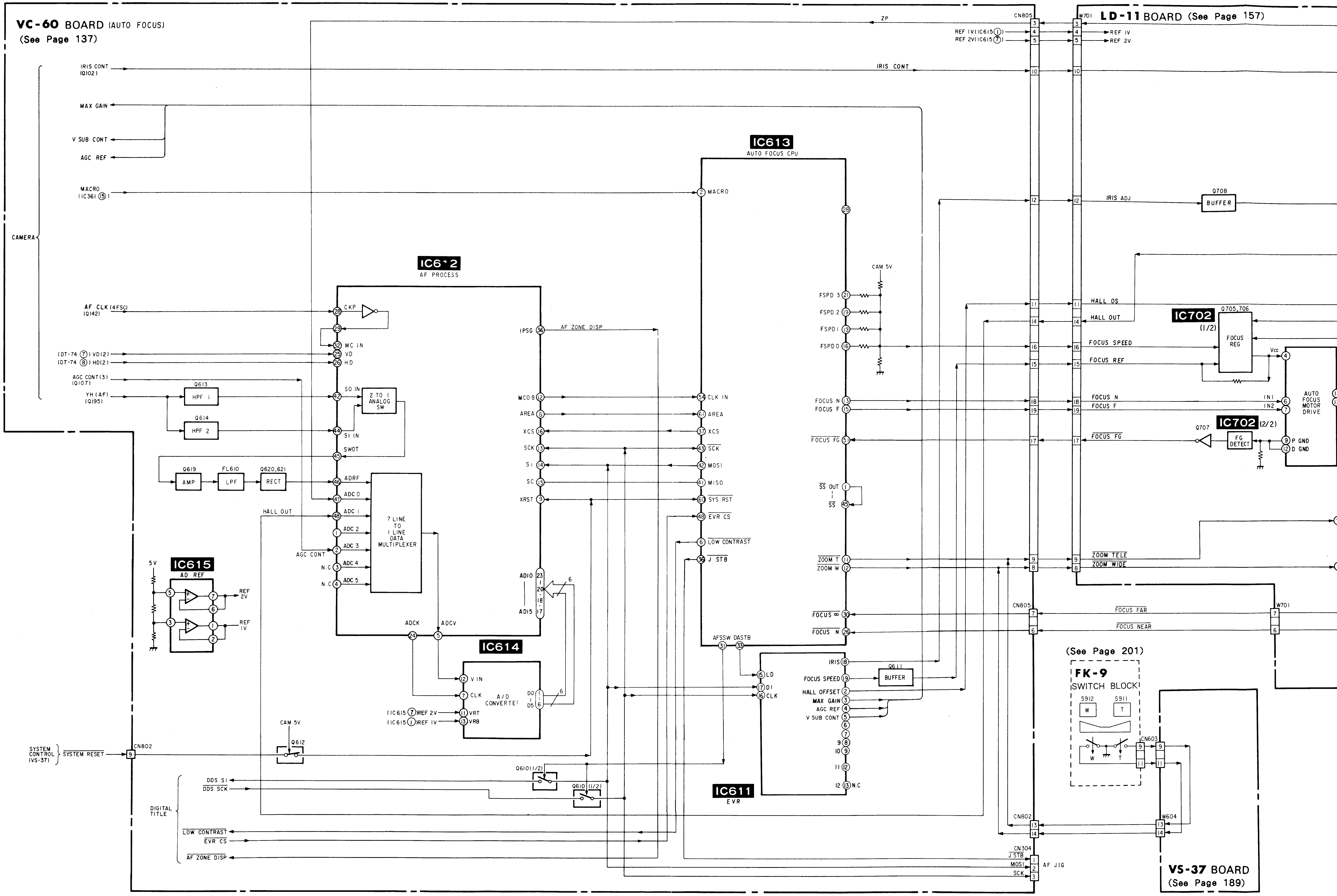
age 127)

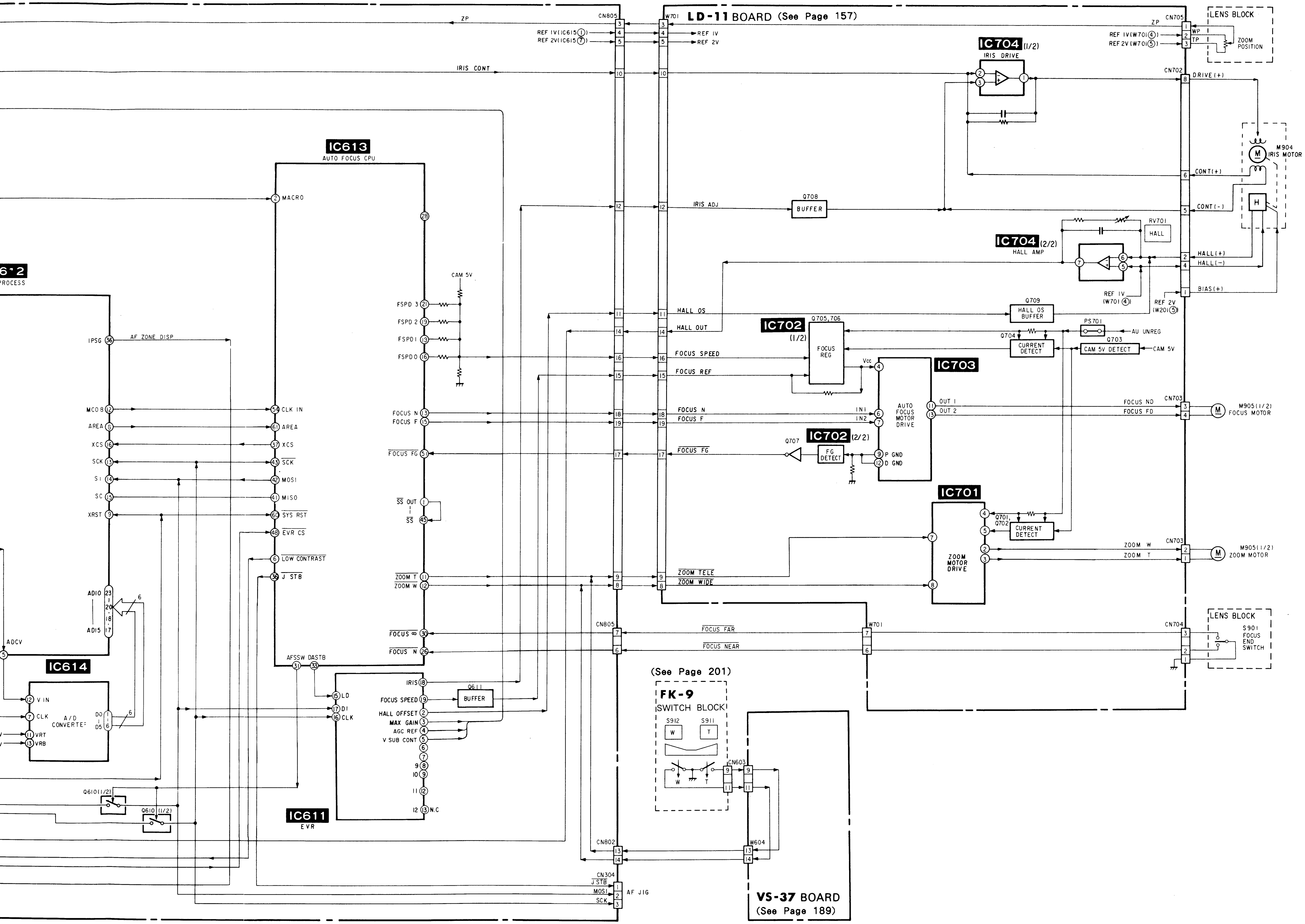


DT-74 BOARD (See Page 214)
IC006
SIGNAL SEPARATION AGC/IRIS CONTROL
IC002
CCD DEFECT COMPENSATOR
IC003
ROM
IC001
V DRIVE
IC004
TIMING GENERATOR
IC252
EVR
IC141 (1/2)
SYNC GENERATOR
IC181
MATRIX
IC182
1H DELAY
IC183
CCD IN
MAX GAIN
AGC REF
FLD
5V(D)
V SUB
PG
H1
H2
LD
CLK
DI
DELTA R
DELTA B
TITLE PEDESTAL
C-PED
R-Y GAIN
B-Y GAIN
R-Y HUE
B-Y HUE
C LEVEL
CHARACTER
R GAIN
B GAIN
CLAMP
S/H
PG CLP
AGC
AGC CLP
AGC CONT
LPF
BLK CLP
MIX
GC
CS CONT
MIX CONT
BAND GAP REG
BUFFER
HOLD BUFFER
SAMPLING
Q009(1/2)
Q007,008
S1 OUT
S2 OUT
Y OUT
DC OUT
CS OUT
CS GAIN
CS SLICE
DE OUT
IRIS OUT
DET OUT
IRIS 6dB
WINDOW
VG
SHUTTER EN
FL181
Q183
Q107
AGC CONT BUFFER
Q101
AGC DET
Q106
AGC SWITCH
Q142
X101
28.375MHz OSC
Q001
10V REG
Q002-005
PG DRIVE
DT-74 BOARD ㉔
DT-74 BOARD ㉑
DT-74 BOARD ⑳
DT-74 BOARD ⑲
DT-74 BOARD ⑪,⑫,⑬
DT-74 BOARD ⑨
DT-74 BOARD ⑦
DT-74 BOARD ⑧
DT-74 BOARD (52)
DT-74 BOARD (51)
0.5Vp-p
0.7Vp-p
0.35Vp-p
4.8Vp-p
2Vp-p
1Vp-p
28.375MHz
14.188MHz
PHASE COMP
DIVIDER
SYNC GENERATOR
CT142
X141
Q141
Q102,103
IRIS DET
4 FSC
AF CLOCK
HD
VD
SYNC
BLK
BF
LALT
YH (AF)
AGC CONT (3)
AUTO FOCUS
IRIS CONT
CLP 0
CLP 2
AP CUT
Q185,186
AP LEVEL CONT
SLICE
AP GAIN
OFFSET
AGC CONT
Y IN
CLP
1H DELAY
Q194
Y DLOUT
FL182
Q184
Y γ CONT
L183,C233
14.2MHz BPF
Q195
Q196
Q181,182
Q192(1/2)
Q193(1/2)
CO OUT
C1 OUT
Y0 OUT
Y1 OUT
DL C1 IN
DL C2 IN
DL Y1 IN
DL Y2 IN
C1 GAIN
C2 GAIN
Y1 GAIN
R OUT
B OUT
G OUT
DC OUT
R MTX
B MTX
ID
CS GAIN
CS Y OUT
VCS GAIN
Q189
Q190
Q191
BLANKING
CS Y
C BLK
HD MIX
COMP
SLICE
MAX
YL IN
Y GAIN
AGC MIX
YH OUT
YL-YH OUT
SW
Q187
Q188
FL301
DELAY
XDL 1
XDL 2
CLOCK
CLAMP
CLP 3
IC181 ⑮
IC181 ⑫
IC181 ⑬
0.35Vp-p
0.3Vp-p
0.54Vp-p
IC141 ①
IC141 (32)
IC141 (31)
IC141 (30)

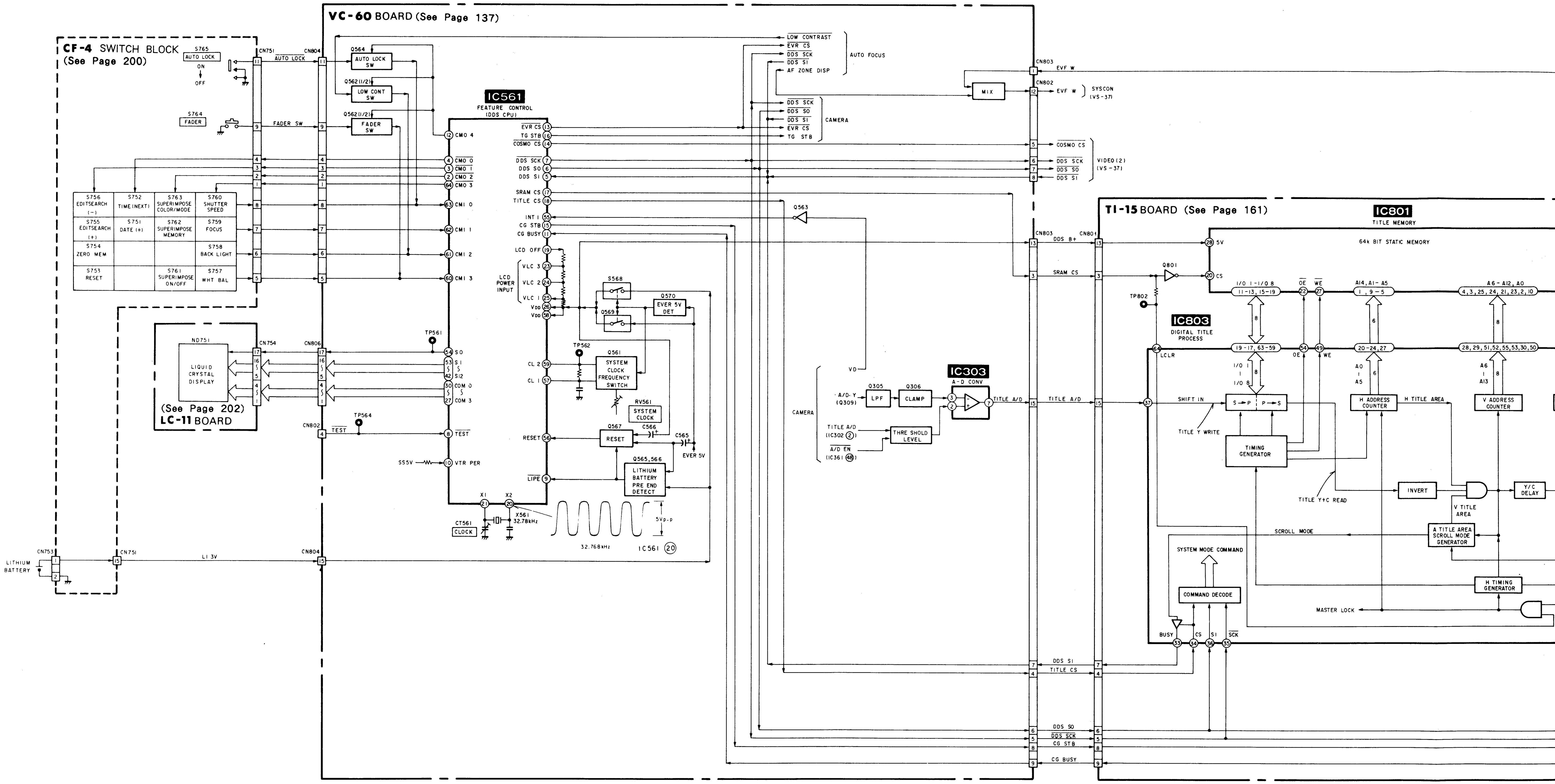

IC181
MATRIX
IC182
1H DELAY
IC183
IC251
PROCESS
IC253
BLANKING/CLAMP
IC301
ENCODER
CHECK POINT ARRAY
OFFSET MIX
YL(PF) OUT
SHTTER EN
YO
Y1
CO
C1
V SUB
CCD OUT
ID(2)
YH(MIX OUT)
CAM Y
CAM C
OFFSET CONT
G OUT CHK
GND
AW ADJ
CAM ADJ
IC181 (15)
0.35Vp-p
IC181 (12)
0.3Vp-p
IC181 (13)
0.54Vp-p
IC253 (6)
0.6Vp-p
IC253 (5)
0.34Vp-p
IC301 (24)
0.76Vp-p
IC301 (45)
IC301 (1)
0.28Vp-p
IC301 (40)
0.5Vp-p
R OUT
B OUT
G OUT
DC OUT
R MTX
B MTX
ID
HD(3)
CS GAIN
CS Y OUT
VCS GAIN
CS Y
C BLK
HD MIX
YH OUT
YL-YH OUT
Y GAIN
YL IN
AGC MIX
FL301
DELAY
Q303
BLK
S AGC CONT
B GAIN
R GAIN
DELTA B
DELTA R
C LEVEL
C PED
R-Y HUE
B-Y HUE
R-Y GAIN
B-Y GAIN
TITLE PEDESTAL
MATRIX
GATE
YL MIX
YL MATRIX 1
YL MATRIX 2
C-γ CONT
YL-YH OUT
Y-γ CONT
Y PED
CLP 2
TITLE (R-Y) MIX
TITLE (B-Y) MIX
TY MATRIX
MODULATOR
BLANKING FADER SUPRESS
BURST GATE
SYNC CHARACTER MIX
GAIN CONTROL
WHITE CLIP
Y FADER
Y BLK
0.18μsec DELAY
NOISE SLICE
D301
FL304
4.43MHz BPF
Q302
BUFFER
Q304
DELAY
Q331
MIX
W303
CAM C
CAM Y
VIDEO (1)
(VS-37)
CAM C OUT
CAM Y OUT (2)
BLK
CAMERA REC
CN803
TB
TG
TR
TY MIX
TY BLK
DIGITAL TITLE (TI-15)
VD
HD
A/D Y
AD EN
TITLE A/D
DIGITAL TITLE
FADER
VIDEO OUT
CHARACTER
CAM Y OUT (1)
SET UP
SYNC
SYNC LEVEL
Y LEVEL
SHP LEVEL
5V

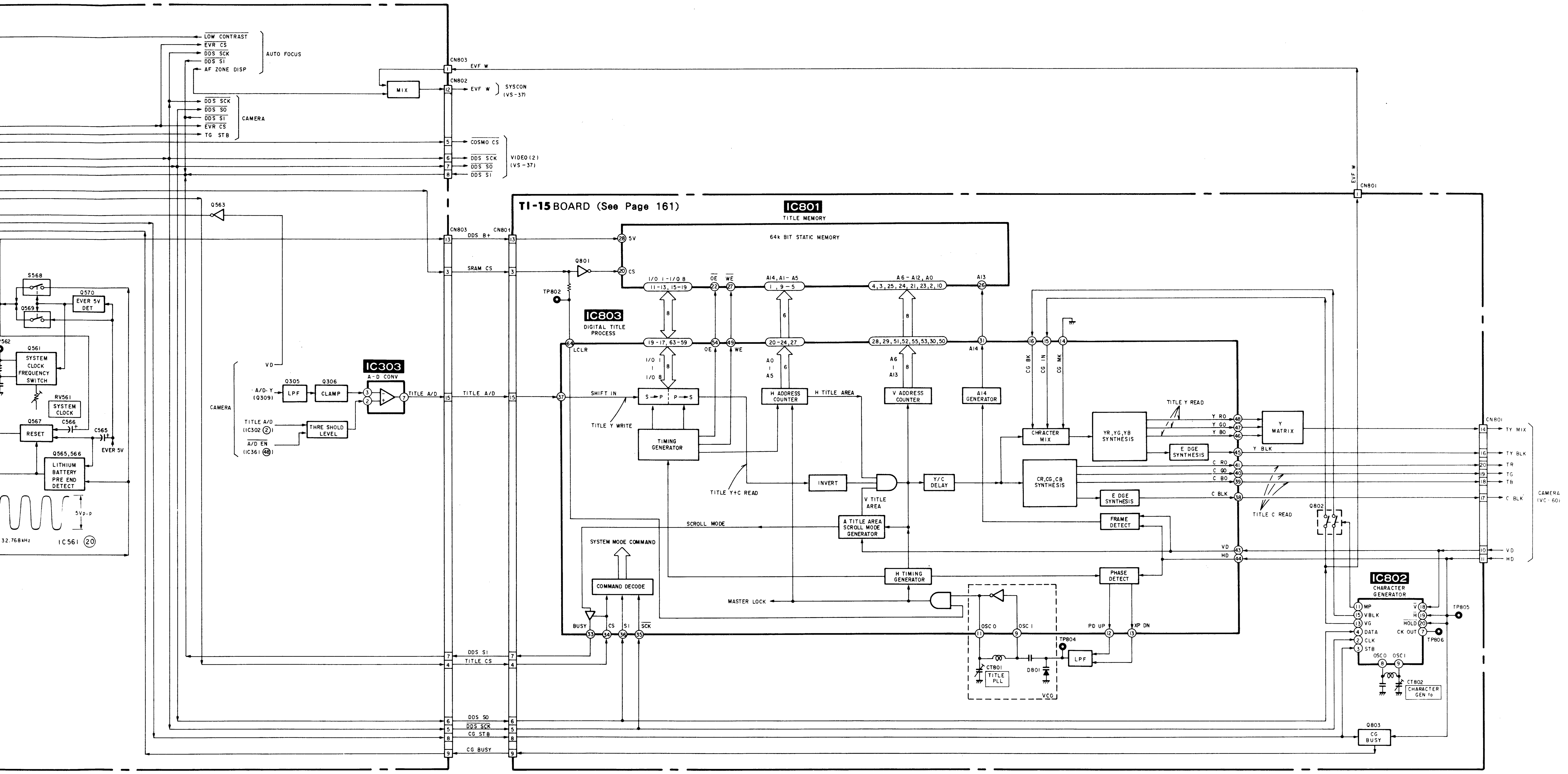
3-4. AUTO FOCUS BLOCK DIAGRAM


VC-60 BOARD (AUTO FOCUS)
(See Page 137)
CAMERA
IRIS CONT (Q102)
MAX GAIN
V SUB CONT
AGC REF
MACRO (IC361 ⑮)
AF CLK (4FSC) (Q142)
(DT-74 ⑦) VD(2)
(DT-74 ⑧) HD(2)
AGC CONT(3) (Q107)
YH (AF) (Q195)
Q613
HPF 1
Q614
HPF 2
Q619
AMP
FL610
LPF
Q620,621
RECT
HALL OUT
AGC CONT
N.C
IC612
AF PROCESS
CKP
MC IN
VD
HD
SO IN
2 TO 1 ANALOG SW
SI IN
SWOT
ADRF
ADC 0
ADC 1
ADC 2
ADC 3
ADC 4
ADC 5
7 LINE TO 1 LINE DATA MULTIPLEXER
IPSG
AF ZONE DISP
MCO 8
AREA
XCS
SCK
SI
SC
XRST
ADI0
ADI5
ADCK
ADCV
IC614
V IN
CLK
A/D CONVERTER
VRT
VRB
D0
D5
(IC615 ⑦)REF 2V
(IC615 ①)REF 1V
5V
IC615
AD REF
REF 2V
REF 1V
CAM 5V
Q612
SYSTEM CONTROL (VS-37)
SYSTEM RESET
CN802
Q610(1/2)
DIGITAL TITLE
DDS SI
DDS SCK
LOW CONTRAST
EVR CS
AF ZONE DISP
IC613
AUTO FOCUS CPU
MACRO
CLK IN
AREA
XCS
SCK
MOSI
MISO
SYS RST
EVR CS
LOW CONTRAST
J STB
AFSSW
DASTB
CAM 5V
FSPD 3
FSPD 2
FSPD 1
FSPD 0
FOCUS N
FOCUS F
FOCUS FG
SS OUT
SS
ZOOM T
ZOOM W
FOCUS ∞
FOCUS N
IC611
EVR
LD
DI
CLK
IRIS
FOCUS SPEED
HALL OFFSET
MAX GAIN
AGC REF
V SUB CONT
N.C
Q611
BUFFER
ZP
REF 1V(IC615 ①)
REF 2V(IC615 ⑦)
IRIS CONT
CN805
W701
LD-11 BOARD (See Page 157)
REF 1V
REF 2V
IRIS ADJ
Q708
BUFFER
HALL OS
HALL OUT
FOCUS SPEED
FOCUS REF
FOCUS N
FOCUS F
FOCUS FG
ZOOM TELE
ZOOM WIDE
IC702 (1/2)
Q705,706
FOCUS REG
Vcc
IN1
IN2
AUTO FOCUS MOTOR DRIVE
IC702 (2/2)
Q707
FG DETECT
P GND
D GND
FOCUS FAR
FOCUS NEAR
(See Page 201)
FK-9 SWITCH BLOCK
S912
S911
W
T
CN603
W604
CN304
J STB
MOSI
SCK
AF JIG
VS-37 BOARD
(See Page 189)

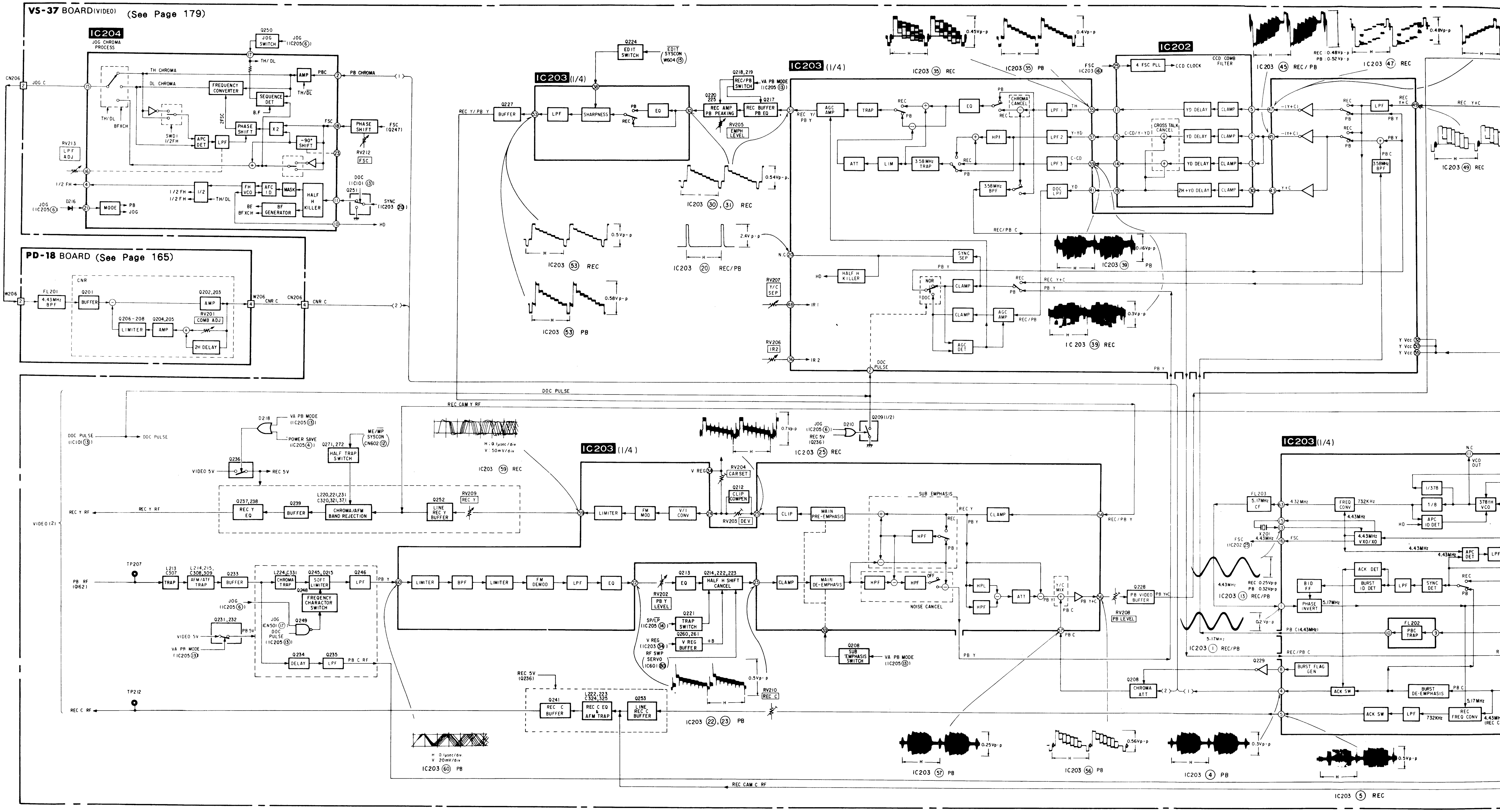

LD-11 BOARD (See Page 157)
IC613
AUTO FOCUS CPU
IC614
A/D CONVERTER
IC611
EVR
IC704 (1/2)
IRIS DRIVE
IC704 (2/2)
HALL AMP
IC702 (1/2)
FOCUS REG
IC702 (2/2)
FG DETECT
IC703
AUTO FOCUS MOTOR DRIVE
IC701
ZOOM MOTOR DRIVE
Q708 BUFFER
Q709 HALL OS BUFFER
Q611 BUFFER
Q704 CURRENT DETECT
Q703 CAM 5V DETECT
Q701, Q702 CURRENT DETECT
Q705,706
Q707
PS701
RV701 HALL
CN805
CN802
CN304
W701
CN705
CN702
CN703
CN704
W604
CN603
ZP
REF 1V(IC615①)
REF 2V(IC615⑦)
REF 1V
REF 2V
IRIS CONT
IRIS ADJ
HALL OS
HALL OUT
FOCUS SPEED
FOCUS REF
FOCUS N
FOCUS F
FOCUS FG
ZOOM TELE
ZOOM WIDE
FOCUS FAR
FOCUS NEAR
DRIVE(+)
CONT(+)
CONT(-)
HALL(+)
HALL(-)
BIAS(+)
REF 1V (W701④)
REF 2V (W201⑤)
REF 1V(W701④)
REF 2V(W701⑤)
AU UNREG
CAM 5V
FOCUS ND
FOCUS FD
ZOOM W
ZOOM T
LENS BLOCK
WP
TP
ZOOM POSITION
M904 IRIS MOTOR
H
M905(1/2) FOCUS MOTOR
M905(1/2) ZOOM MOTOR
S901 FOCUS END SWITCH
6·2
PROCESS
IPSG ㊱
AF ZONE DISP
MCO 8 ⑫
AREA ⑥
XCS ⑯
SCK ⑬
SI ⑭
SC ⑮
XRST ⑨
ADI0
ADI5
ADCV
MACRO
CLK IN
AREA
XCS
SCK
MOSI
MISO
SYS RST
EVR CS
LOW CONTRAST
J STB
FSPD 3
FSPD 2
FSPD 1
FSPD 0
CAM 5V
FOCUS N
FOCUS F
FOCUS FG
SS OUT
SS
ZOOM T
ZOOM W
FOCUS ∞
FOCUS N
AFSSW DASTB
V IN
CLK
VRT
VRB
D0
D5
LD
DI
CLK
IRIS
FOCUS SPEED
HALL OFFSET
MAX GAIN
AGC REF
V SUB CONT
N.C
Q610(1/2)
Q610 (1/2)
J STB
MOSI
SCK
AF JIG
Vcc
IN1
IN2
OUT 1
OUT 2
P GND
D GND
(See Page 201)
FK-9
SWITCH BLOCK
S912
S911
W
T
VS-37 BOARD
(See Page 189)

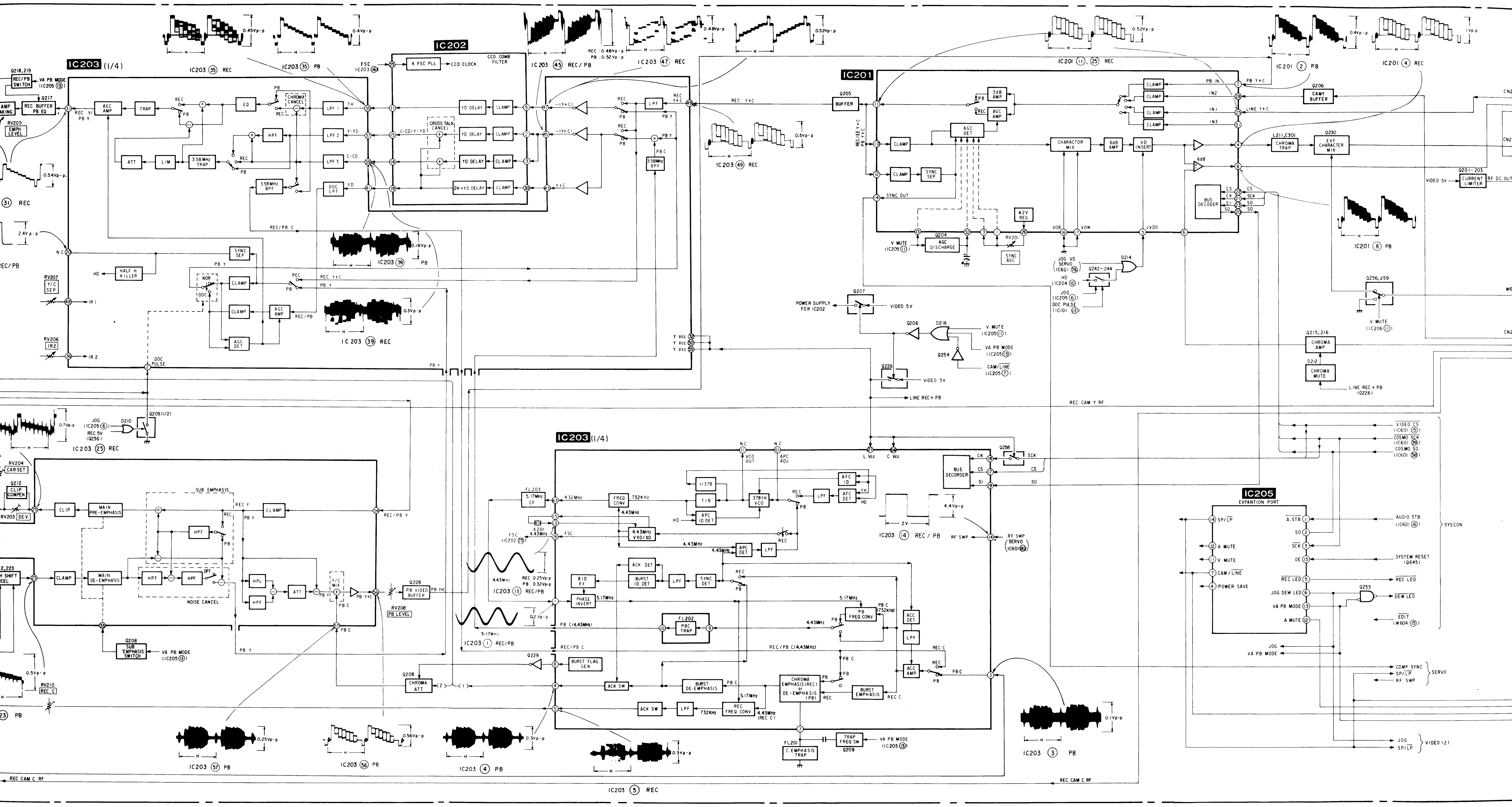
3-5. DIGITAL TAITLLER BLOCK DIAGRAM

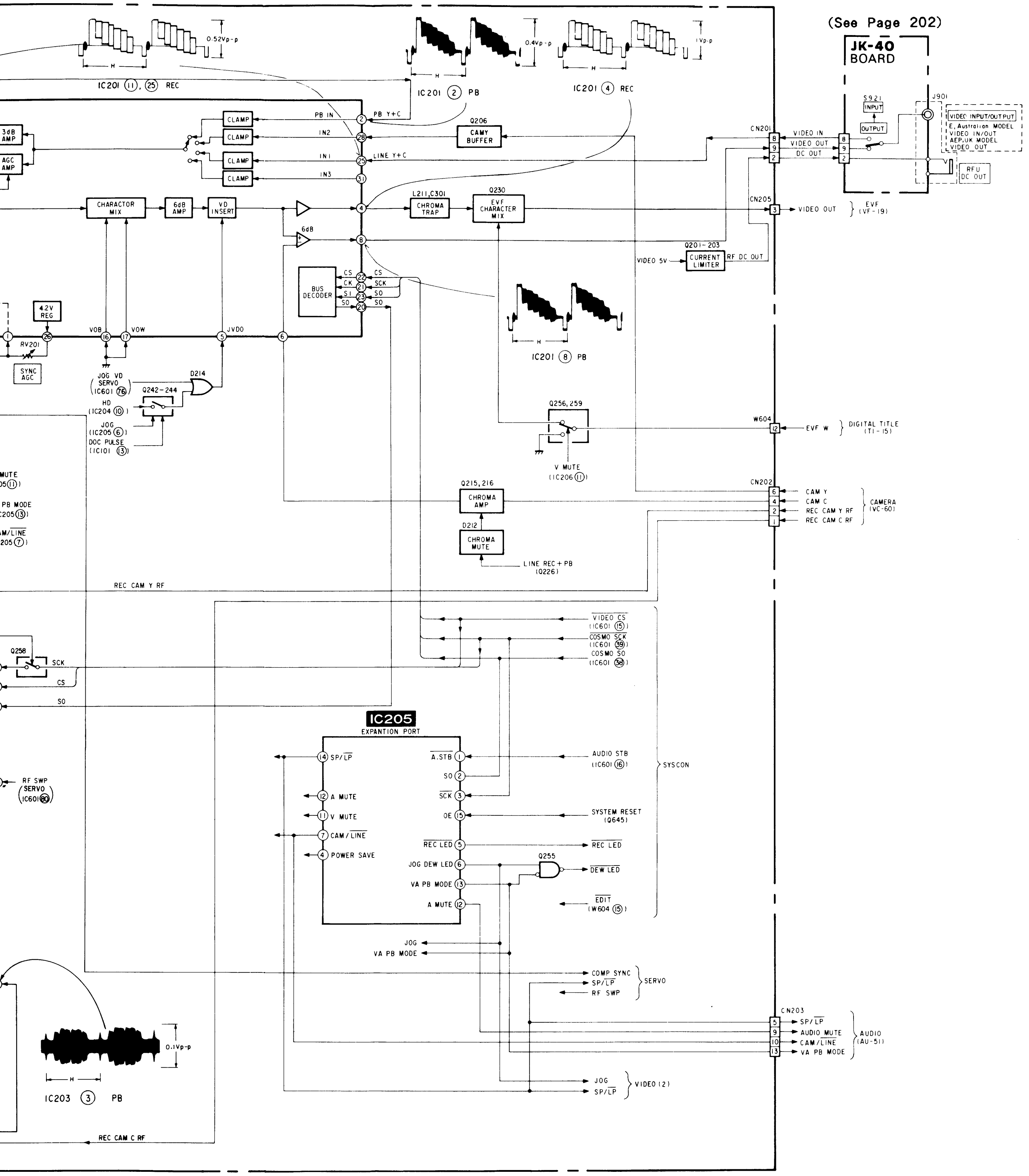

VC-60 BOARD (See Page 137)
CF-4 SWITCH BLOCK (See Page 200)
S765 AUTO LOCK
ON
OFF
S764 FADER
S756 EDITSEARCH (−)
S752 TIME(NEXT)
S763 SUPERIMPOSE COLOR/MODE
S760 SHUTTER SPEED
S755 EDITSEARCH (+)
S751 DATE (+)
S762 SUPERIMPOSE MEMORY
S759 FOCUS
S754 ZERO MEM
S758 BACK LIGHT
S753 RESET
S761 SUPERIMPOSE ON/OFF
S757 WHT BAL
CN751
CN804
AUTO LOCK
FADER SW
Q564 AUTO LOCK SW
Q562(1/2) LOW CONT SW
Q562(1/2) FADER SW
IC561 FEATURE CONTROL (DDS CPU)
CMO 4
CMO 0
CMO 1
CMO 2
CMO 3
CMI 0
CMI 1
CMI 2
CMI 3
EVR CS
TG STB
COSMO CS
DDS SCK
DDS SO
DDS SI
SRAM CS
TITLE CS
INT 1
CG STB
CG BUSY
LCD OFF
LCD POWER INPUT
VLC 3
VLC 2
VLC 1
VDD
CL 2
CL 1
RESET
LIPE
S0
S1
S12
COM 0
COM 3
TEST
VTR PER
S5V
X1
X2
X561 32.768kHz
CT561 CLOCK
32.768kHz
5Vp-p
IC561 ⑳
TP561
TP562
TP564
S568
S569
Q570 EVER 5V DET
Q561 SYSTEM CLOCK FREQUENCY SWITCH
RV561 SYSTEM CLOCK
Q567 RESET
C566
C565
EVER 5V
Q565,566 LITHIUM BATTERY PRE END DETECT
ND751 LIQUID CRYSTAL DISPLAY
CN754
CN806
(See Page 202) LC-11 BOARD
CN802
TEST
CN753
LITHIUM BATTERY
LI 3V
LOW CONTRAST
EVR CS
DDS SCK
DDS SI
AF ZONE DISP
AUTO FOCUS
DDS SCK
DDS SO
DDS SI
EVR CS
TG STB
CAMERA
Q563
CN803
EVF W
CN802
MIX
EVF W
SYSCON (VS-37)
COSMO CS
DDS SCK
DDS SO
DDS SI
VIDEO(2) (VS-37)
VD
A/D-Y (Q309)
Q305 LPF
Q306 CLAMP
IC303 A-D CONV
TITLE A/D
TITLE A/D (IC302 ②)
A/D EN (IC361 ㊽)
THRE SHOLD LEVEL
CAMERA
CN803
CN801
DDS B+
SRAM CS
TITLE A/D
DDS SI
TITLE CS
DDS SO
DDS SCK
CG STB
CG BUSY
TI-15 BOARD (See Page 161)
IC801 TITLE MEMORY
64k BIT STATIC MEMORY
5V
CS
Q801
TP802
I/O 1 - I/O 8
11-13, 15-19
OE
WE
A14, A1 - A5
1, 9-5
A6 - A12, A0
4, 3, 25, 24, 21, 23, 2, 10
IC803 DIGITAL TITLE PROCESS
LCLR
19-17, 63-59
20-24, 27
28, 29, 51, 52, 55, 53, 30, 50
SHIFT IN
S→P
P→S
TITLE Y WRITE
TIMING GENERATOR
H ADDRESS COUNTER
H TITLE AREA
V ADDRESS COUNTER
A0 I A5
A6 I A13
TITLE Y+C READ
INVERT
Y/C DELAY
V TITLE AREA
A TITLE AREA SCROLL MODE GENERATOR
SCROLL MODE
SYSTEM MODE COMMAND
COMMAND DECODE
H TIMING GENERATOR
MASTER LOCK
BUSY
CS
SI
SCK


LOW CONTRAST
EVR CS
DDS SCK
DDS SI
AF ZONE DISP
AUTO FOCUS
CN803
EVF W
CN802
MIX
EVF W
SYSCON
(VS-37)
DDS SCK
DDS SO
DDS SI
EVR CS
TG STB
CAMERA
COSMO CS
DDS SCK
DDS SO
DDS SI
VIDEO (2)
(VS-37)
Q563
S568
Q570
EVER 5V DET
Q569
Q562
Q561
SYSTEM CLOCK FREQUENCY SWITCH
RV561
SYSTEM CLOCK
Q567
RESET
C566
C565
EVER 5V
Q565,566
LITHIUM BATTERY PRE END DETECT
5Vp-p
32.768kHz
IC561 ⑳
VD
CAMERA
A/D-Y (Q309)
Q305
LPF
Q306
CLAMP
IC303
A-D CONV
TITLE A/D
TITLE A/D (IC302 ②)
THRE SHOLD LEVEL
A/D EN (IC361 ㊽)
TI-15 BOARD (See Page 161)
IC801
TITLE MEMORY
64k BIT STATIC MEMORY
CN803
CN801
DDS B+
5V
SRAM CS
Q801
CS
TP802
I/O 1-I/O 8
11-13, 15-19
OE
WE
A14, A1-A5
1, 9-5
A6-A12, A0
4, 3, 25, 24, 21, 23, 2, 10
A13
IC803
DIGITAL TITLE PROCESS
LCLR
19-17, 63-59
OE
WE
20-24, 27
28, 29, 51, 52, 55, 53, 30, 50
A14
CG BK
CG IN
CG MK
I/O 1 I I/O 8
A0 I A5
A6 I A13
TITLE A/D
SHIFT IN
S→P P→S
TITLE Y WRITE
H ADDRESS COUNTER
H TITLE AREA
V ADDRESS COUNTER
A14 GENERATOR
TIMING GENERATOR
TITLE Y+C READ
INVERT
Y/C DELAY
V TITLE AREA
A TITLE AREA SCROLL MODE GENERATOR
SCROLL MODE
SYSTEM MODE COMMAND
COMMAND DECODE
BUSY
CS
SI
SCK
H TIMING GENERATOR
MASTER LOCK
OSC O
OSC I
CT801
TITLE PLL
D801
VCO
TP804
LPF
PD UP
XP DN
PHASE DETECT
FRAME DETECT
CHRACTER MIX
YR, YG, YB SYNTHESIS
TITLE Y READ
Y RO
Y GO
Y BO
Y MATRIX
E DGE SYNTHESIS
Y BLK
CR, CG, CB SYNTHESIS
C RO
C GO
C BO
C BLK
E DGE SYNTHESIS
TITLE C READ
VD
HD
Q802
EVF W
CN801
TY MIX
TY BLK
TR
TG
TB
C BLK
VD
HD
CAMERA (VC-60)
IC802
CHARACTER GENERATOR
MP
VBLK
VG
DATA
CLK
STB
V
H
HOLD
CK OUT
TP805
TP806
OSCO
OSCI
CT802
CHARACTER GEN fo
Q803
CG BUSY
DDS SI
TITLE CS
DDS SO
DDS SCK
CG STB
CG BUSY

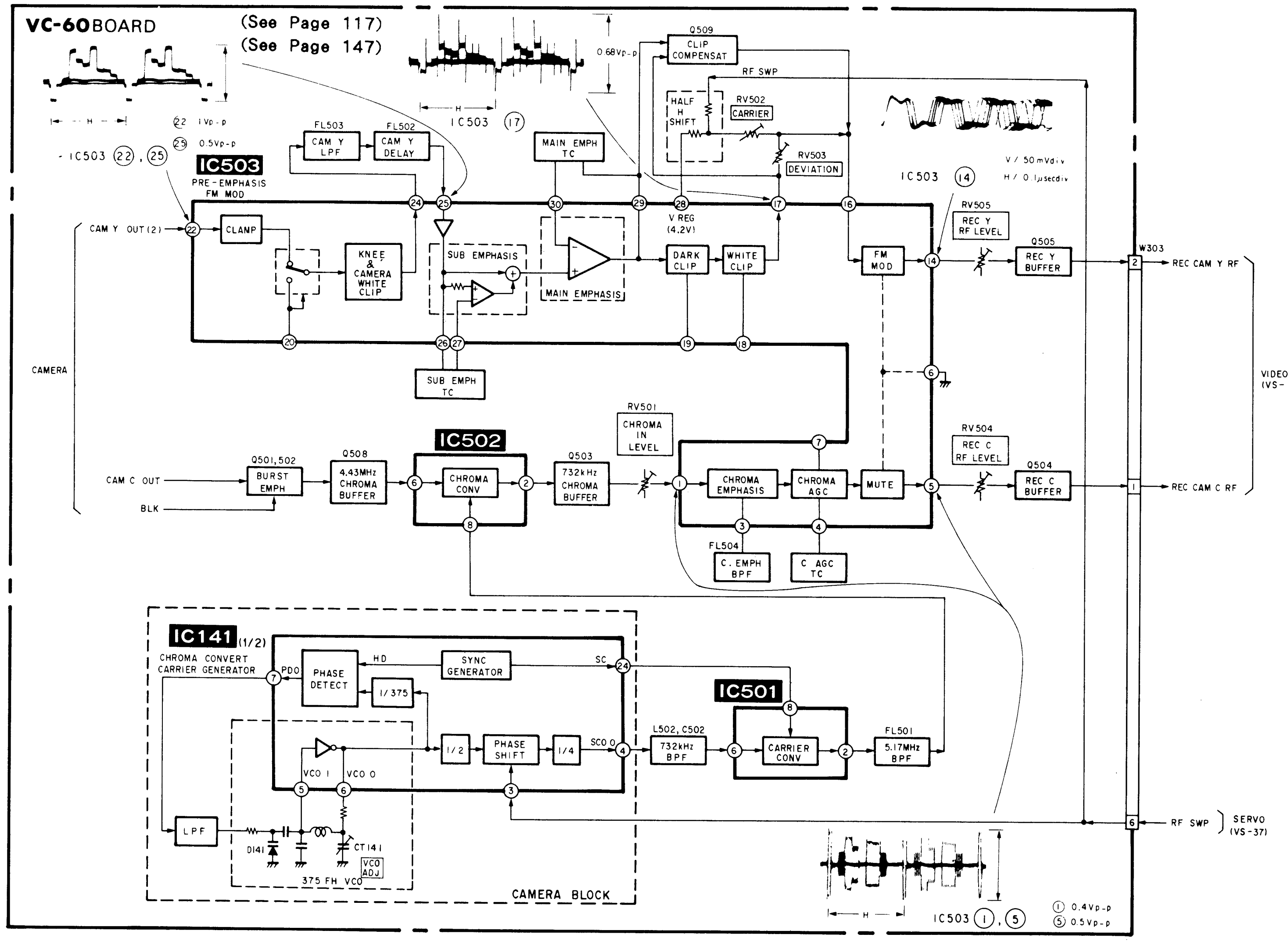
3-6. VIDEO BLOCK DIAGRAM (1)


VS-37 BOARD (VIDEO) (See Page 179)
IC204
JOG CHROMA PROCESS
Q250 JOG SWITCH
JOG (IC205 ⑥)
TH CHROMA
DL CHROMA
FREQUENCY CONVERTER
SEQUENCE DET
AMP
PBC
PB CHROMA
TH/DL
PHASE SHIFT
X2
-90° SHIFT
APC DET
LPF
SWD1 1/2FH
BFXCH
FSC
PHASE SHIFT
FSC (Q247)
RV212 FSC
RV213 LPF ADJ
1/2 FH
FH VCO
AFC I.D
MASK
HALF H KILLER
BF GENERATOR
DOC (IC101 ⑬)
Q251
SYNC (IC203 ⑳)
HD
D216
MODE
PB
JOG
JOG (IC205 ⑥)
CN206
JOG C
PD-18 BOARD (See Page 165)
W206
FL201 4.43MHz BPF
CNR
Q201 BUFFER
Q202,203 AMP
RV201 COMB ADJ
Q206-208 LIMITER
Q204,205 AMP
2H DELAY
CNR C
IC203 (1/4)
Q224 EDIT SWITCH
EDIT SYSCON (W604 ⑤)
Q227 BUFFER
REC Y/PB Y
LPF
SHARPNESS
EQ
Q220,225 REC AMP PB PEAKING
Q218,219 REC/PB SWITCH
VA PB MODE (IC205 ⑬)
Q217 REC BUFFER PB EQ
RV205 EMPH LEVEL
IC203 ㉚, ㉛ REC
0.54Vp-p
IC203 53 REC
0.5Vp-p
IC203 53 PB
0.58Vp-p
IC203 ⑳ REC/PB
2.4Vp-p
IC203 (1/4)
AGC AMP
TRAP
EQ
CHROMA CANCEL
LPF 1
LPF 2
LPF 3
DOC LPF
HPF
ATT
LIM
3.58MHz TRAP
3.58MHz BPF
REC/PB C
SYNC SEP
HALF H KILLER
RV207 Y/C SEP
RV206 IR2
IR 1
IR 2
NOR
DOC
CLAMP
AGC AMP
AGC DET
DOC PULSE
IC203 ㉟ REC
IC203 ㉟ PB
0.45Vp-p
0.4Vp-p
IC203 ㊴ PB
0.16Vp-p
IC 203 ㊴ REC
0.3Vp-p
IC202
4 FSC PLL
CCD CLOCK
CCD COMB FILTER
FSC (IC203 ⑥)
YD DELAY
CROSS TALK CANCEL
2H+YD DELAY
CLAMP
C-CD/Y-YD
IC203 ㊺ REC/PB
IC203 ㊼ REC
0.48Vp-p
REC: 0.48Vp-p
PB: 0.52Vp-p
-(Y+C)
Y+C
REC Y+C
LPF
3.58MHz BPF
PB C
IC203 ㊾ REC
Y Vcc
DOC PULSE
REC CAM Y RF
D218
VA PB MODE (IC205 ⑬)
POWER SAVE (IC205 ④)
Q236
VIDEO 5V
REC 5V
Q271,272 HALF TRAP SWITCH
ME/MP SYSCON (CN602 ⑫)
Q237,238 REC Y EQ
Q239 BUFFER
L220,221,231 C320,321,371 CHROMA/AFM BAND REJECTION
Q252 LINE REC Y BUFFER
RV209 REC Y
REC Y RF
VIDEO (2)
DOC PULSE (IC101 ⑬)
H: 0.1μsec/div V: 50mV/div
IC203 59 REC
IC203 (1/4)
LIMITER
FM MOD
V/I CONV
V REG
RV204 CARSET
Q212 CLIP COMPEN
RV203 DEV
CLIP
MAIN PRE-EMPHASIS
SUB EMPHASIS
REC/PB Y
0.7Vp-p
JOG (IC205 ⑥)
REC 5V (Q236)
D210
Q209 (1/2)
IC203 ㉕ REC
TP207
PB RF (Q162)
L213 C307 TRAP
L214,215 C308,309 AFM/ATF TRAP
Q233 BUFFER
L224,C331 CHROMA TRAP
Q245,D215 SOFT LIMITER
Q246 LPF
Q248 FREQUENCY CHARACTOR SWITCH
Q249
JOG (CN501 ⑰)
DOC PULSE (IC205 ⑬)
Q231,232
PB 5V
VA PB MODE (IC205 ⑬)
Q234 DELAY
Q235 LPF
PB C RF
LIMITER
BPF
FM DEMOD
RV202 PB Y LEVEL
Q213 EQ
Q214,222,223 HALF H SHIFT CANCEL
SP/LP (IC205 ⑭)
Q221 TRAP SWITCH
Q260,261 V REG BUFFER
V REG (IC203 54)
RF SWP SERVO (IC601 ⑳)
+B
CLAMP
MAIN DE-EMPHASIS
NOISE CANCEL
OFF
Y/C MIX
Q208 SUB EMPHASIS SWITCH
Q228 PB VIDEO BUFFER
RV208 PB LEVEL
0.5Vp-p
RV210 REC C
IC203 ㉒, ㉓ PB
TP212
REC C RF
REC 5V (Q236)
Q241 REC C BUFFER
L222,223 C324,325 REC C EQ & AFM TRAP
Q253 LINE REC C BUFFER
H: 0.1μsec/div V: 20mV/div
IC203 60 PB
IC203 ㊼ PB
0.25Vp-p
IC203 56 PB
0.56Vp-p
IC203 ④ PB
0.3Vp-p
REC CAM C RF
Q208 CHROMA ATT
IC203 (1/4)
VCO OUT
1/378
1/8
378fH VCO
APC ID DET
FL203 5.17MHz CF
4.32MHz
FREQ CONV
732KHz
4.43MHz
X201 4.43MHz
FSC (IC202 ㉙)
4.43MHz VXO/XO
APC DET
ACK DET
BURST ID DET
BID FF
PHASE INVERT
5.17MHz
SYNC DET
4.43MHz REC 0.25Vp-p PB 0.32Vp-p
IC203 ⑬ REC/PB
5.17MHz
0.2Vp-p
IC203 ① REC/PB
PB C(4.43MHz)
FL202 PBC TRAP
REC/PB C
Q229
BURST FLAG GEN
ACK SW
BURST DE-EMPHASIS
5.17MHz
REC FREQ CONV
732KHz
IC203 ⑤ REC
0.5Vp-p

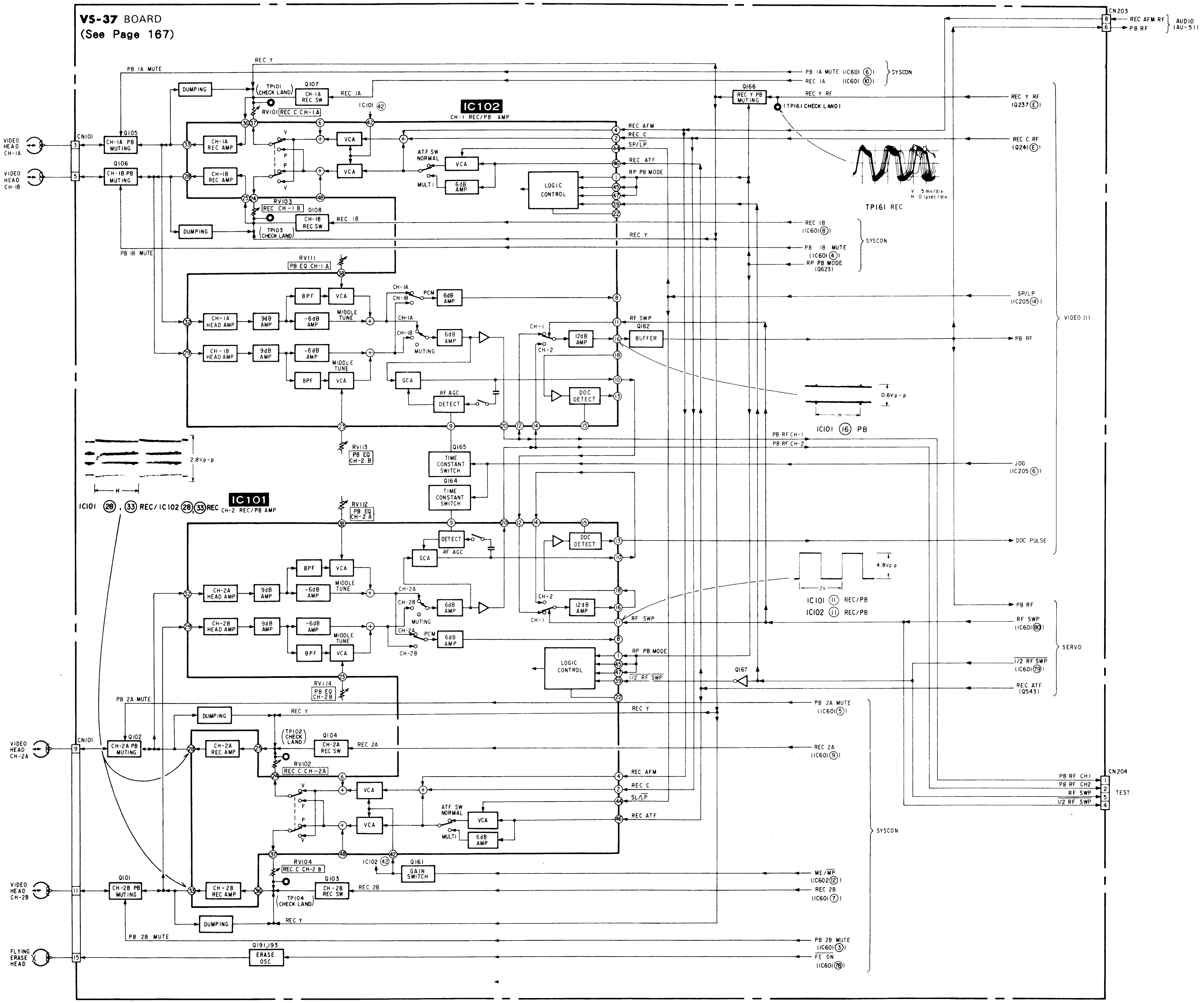

IC203 (1/4)
IC202
IC201
IC203 (1/4)
IC205
EXPANTION PORT
CCD COMB FILTER
4 FSC PLL
CCD CLOCK
YD DELAY
CLAMP
2H+YD DELAY
CROSS TALK CANCEL
AGC AMP
TRAP
EQ
CHROMA CANCEL
LPF 1
LPF 2
LPF 3
DOC LPF
HPF
ATT
LIM
3.58MHz TRAP
3.58MHz BPF
SYNC SEP
HALF H KILLER
NOR DOC
AGC DET
RV207 Y/C SEP
RV206 IR2
RV205 EMPH LEVEL
Q217
REC BUFFER PB EQ
Q218, 219
REC/PB SWITCH
VA PB MODE (IC205 ⑬)
IC203 ㉟ REC
IC203 ㉟ PB
IC203 ㊺ REC/PB
IC203 ㊼ REC
IC203 ㊾ REC
IC203 ㊴ PB
IC203 ㊴ REC
IC203 ㉕ REC
IC203 ㉓ PB
IC203 ㊼ PB
IC203 ㊻ PB
IC203 ④ PB
IC203 ⑤ REC
IC203 ⑭ REC / PB
IC203 ⑬ REC/PB
IC203 ① REC/PB
IC203 ③ PB
0.45Vp-p
0.4Vp-p
0.48Vp-p
0.52Vp-p
0.54Vp-p
0.5Vp-p
0.16Vp-p
0.3Vp-p
0.7Vp-p
0.25Vp-p
0.56Vp-p
0.1Vp-p
4.4Vp-p
REC 0.48Vp-p
PB 0.52Vp-p
REC 0.25Vp-p
PB 0.32Vp-p
0.2Vp-p
DOC PULSE
JOG (IC205 ⑥)
REC 5V (Q236)
D210
Q209 (1/2)
RV204 CAR SET
Q212 CLIP COMPEN
RV203 DEV
SUB EMPHASIS
CLIP
MAIN PRE-EMPHASIS
MAIN DE-EMPHASIS
NOISE CANCEL
Y/C MIX
HPL
Q228
PB VIDEO BUFFER
RV208 PB LEVEL
Q208
SUB EMPHASIS SWITCH
CHROMA ATT
RV210 REC C
REC CAM C RF
FL203 5.17MHz CF
4.32MHz
FREQ CONV
732KHz
4.43MHz
X201
4.43MHz VXO/XO
1/378
1/8
378fH VCO
APC ID DET
AFC ID
AFC DET
APC DET
LPF
VCO OUT
APC ADJ
L Vcc
C Vcc
BUS DECORDER
Q258
CK
CS
SI
SO
SCK
RF SWP
RF SWP SERVO (IC601 ㊿)
ACK DET
BURST ID DET
SYNC DET
BID FF
PHASE INVERT
5.17MHz
FL202 PBC TRAP
PB FREQ CONV
ACC DET
ACC AMP
Q229
BURST FLAG GEN
ACK SW
BURST DE-EMPHASIS
CHROMA EMPHASIS(REC) or DE-EMPHASIS (PB)
BURST EMPHASIS
REC FREQ CONV
4.43MHz (REC C)
FL201 C EMPHASIS TRAP
TRAP FREQ SW Q209
VA PB MODE (IC205 ⑬)
Q205 BUFFER
3dB AMP
AGC AMP
AGC DET
CLAMP
SYNC SEP
SYNC OUT
V MUTE (IC205 ⑪)
Q204 AGC DISCHARGE
RV201 SYNC AGC
4.2V REG
CHARACTOR MIX
6dB AMP
VD INSERT
6dB
BUS DECODER
V08
VOW
JVDO
JOG VD SERVO (IC601 ⑦⑥)
HD (IC204 ⑩)
JOG (IC205 ⑥)
DOC PULSE (IC101 ⑬)
Q242~244
D214
Q207
POWER SUPPLY FOR IC202
VIDEO 5V
Q206
D216
V MUTE (IC205 ⑪)
VA PB MODE (IC205 ⑬)
Q254
CAM/LINE (IC205 ⑦)
Q226
LINE REC+PB
PB IN
PB Y+C
IN2
IN1
IN3
LINE Y+C
Q206 CAMY BUFFER
L211, C301 CHROMA TRAP
Q230 EVF CHARACTER MIX
Q201~203 CURRENT LIMITER
RF DC OUT
IC201 ⑪, ㉕ REC
IC201 ② PB
IC201 ④ REC
IC201 ⑧ PB
Q256, 259
V MUTE (IC206 ⑪)
Q215, 216 CHROMA AMP
D212 CHROMA MUTE
LINE REC + PB (Q226)
REC CAM Y RF
VIDEO CS (IC601 ⑮)
COSMO SCK (IC601 ㊴)
COSMO SO (IC601 ㊳)
SP/LP
A MUTE
V MUTE
CAM/LINE
POWER SAVE
A.STB
SO
SCK
OE
REC LED
JOG DEW LED
VA PB MODE
A MUTE
AUDIO STB (IC601 ⑯)
SYSCON
SYSTEM RESET (Q645)
REC LED
Q255
DEW LED
EDIT (W604 ⑮)
JOG
VA PB MODE
COMP SYNC
SP/LP
RF SWP
SERVO
JOG
SP/LP
VIDEO (2)
REC C RF
REC CAM C RF


IC201 ⑪, ㉕ REC
0.52Vp-p
IC201 ② PB
0.4Vp-p
IC201 ④ REC
1Vp-p
(See Page 202)
JK-40 BOARD
S921
INPUT
OUTPUT
J901
VIDEO INPUT/OUTPUT
E, Australian MODEL
VIDEO IN/OUT
AEP,UK MODEL
VIDEO OUT
RFU DC OUT
CN201
VIDEO IN
VIDEO OUT
DC OUT
CN205
VIDEO OUT
EVF (VF-19)
3dB AMP
AGC AMP
CLAMP
PB IN
IN2
IN1
IN3
PB Y+C
LINE Y+C
Q206
CAMY BUFFER
CHARACTOR MIX
6dB AMP
VD INSERT
6dB
L211,C301
CHROMA TRAP
Q230
EVF CHARACTER MIX
Q201-203
CURRENT LIMITER
VIDEO 5V
RF DC OUT
BUS DECODER
CS
CK
SI
SO
SCK
4.2V REG
RV201
SYNC AGC
VOB
VOW
VDD
JOG VD
(SERVO IC601 ⑯)
Q242-244
D214
HD (IC204 ⑩)
JOG (IC205 ⑥)
DOC PULSE (IC101 ⑬)
IC201 ⑧ PB
Q256, 259
V MUTE (IC206 ⑪)
W604
EVF W
DIGITAL TITLE (TI-15)
CN202
Q215, 216
CHROMA AMP
D212
CHROMA MUTE
LINE REC + PB (Q226)
CAM Y
CAM C
REC CAM Y RF
REC CAM C RF
CAMERA (VC-60)
MUTE
PB MODE
CAM/LINE
REC CAM Y RF
Q258
SCK
CS
SO
VIDEO CS (IC601 ⑮)
COSMO SCK (IC601 ㊴)
COSMO SO (IC601 ㊳)
RF SWP (SERVO IC601)
IC205
EXPANTION PORT
SP/LP
A MUTE
V MUTE
CAM/LINE
POWER SAVE
A.STB
SO
SCK
OE
REC LED
JOG DEW LED
VA PB MODE
A MUTE
AUDIO STB (IC601 ⑥)
SYSTEM RESET (Q645)
REC LED
Q255
DEW LED
EDIT (W604 ⑮)
SYSCON
JOG
VA PB MODE
COMP SYNC
SP/LP
RF SWP
SERVO
CN203
SP/LP
AUDIO MUTE
CAM/LINE
VA PB MODE
AUDIO (AU-51)
JOG
SP/LP
VIDEO (2)
0.1Vp-p
IC203 ③ PB
REC CAM C RF

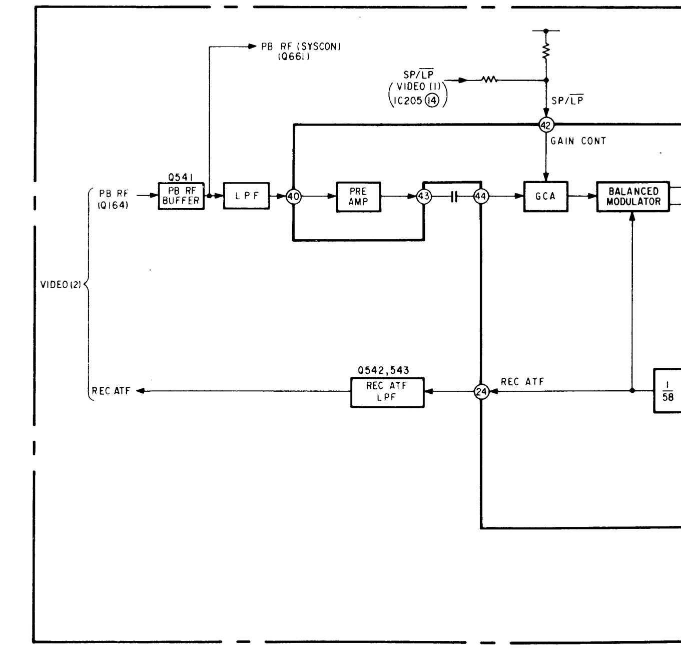
3-7. CAMERA REC BLOCK DIAGRAM

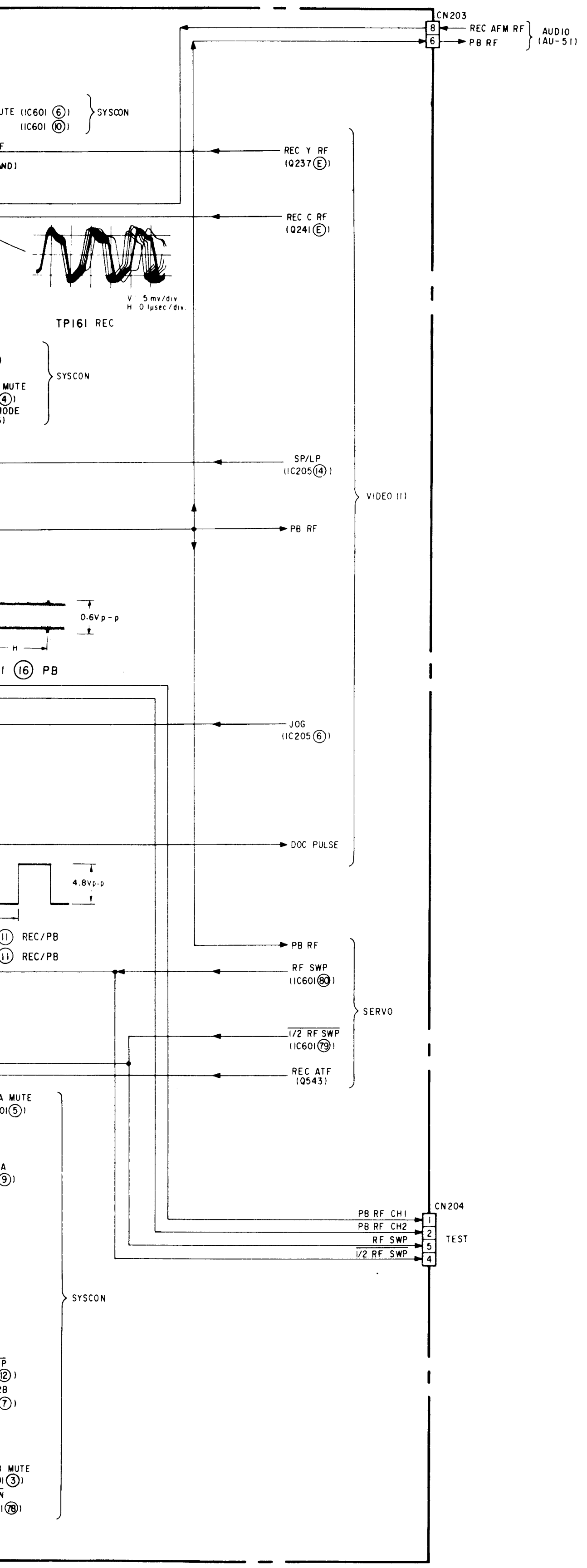

VC-60 BOARD
(See Page 117)
(See Page 147)
IC503 ㉒, ㉕
㉒ 1Vp-p
㉕ 0.5Vp-p
IC503 ⑰
0.68Vp-p
Q509
CLIP COMPENSAT
RF SWP
HALF H SHIFT
RV502
CARRIER
RV503
DEVIATION
IC503 ⑭
V / 50mV/div
H / 0.1μsec/div
FL503
CAM Y LPF
FL502
CAM Y DELAY
IC503
PRE-EMPHASIS FM MOD
MAIN EMPH TC
CAM Y OUT(2)
CLAMP
KNEE & CAMERA WHITE CLIP
SUB EMPHASIS
MAIN EMPHASIS
V REG (4.2V)
DARK CLIP
WHITE CLIP
FM MOD
RV505
REC Y RF LEVEL
Q505
REC Y BUFFER
W303
REC CAM Y RF
VIDEO (1) (VS-37)
CAMERA
SUB EMPH TC
RV501
CHROMA IN LEVEL
IC502
Q501,502
BURST EMPH
Q508
4.43MHz CHROMA BUFFER
CHROMA CONV
Q503
732kHz CHROMA BUFFER
CHROMA EMPHASIS
CHROMA AGC
MUTE
RV504
REC C RF LEVEL
Q504
REC C BUFFER
REC CAM C RF
CAM C OUT
BLK
FL504
C. EMPH BPF
C AGC TC
IC141 (1/2)
CHROMA CONVERT CARRIER GENERATOR
PDO
PHASE DETECT
HD
SYNC GENERATOR
SC
1/375
1/2
PHASE SHIFT
1/4
SCO O
VCO I
VCO O
LPF
D141
CT141
VCO ADJ
375 FH VCO
CAMERA BLOCK
IC501
L502, C502
732kHz BPF
CARRIER CONV
FL501
5.17MHz BPF
RF SWP
SERVO (VS-37)
IC503 ①, ⑤
① 0.4Vp-p
⑤ 0.5Vp-p

3-8. VIDEO BLOCK DIAGRAM (2)

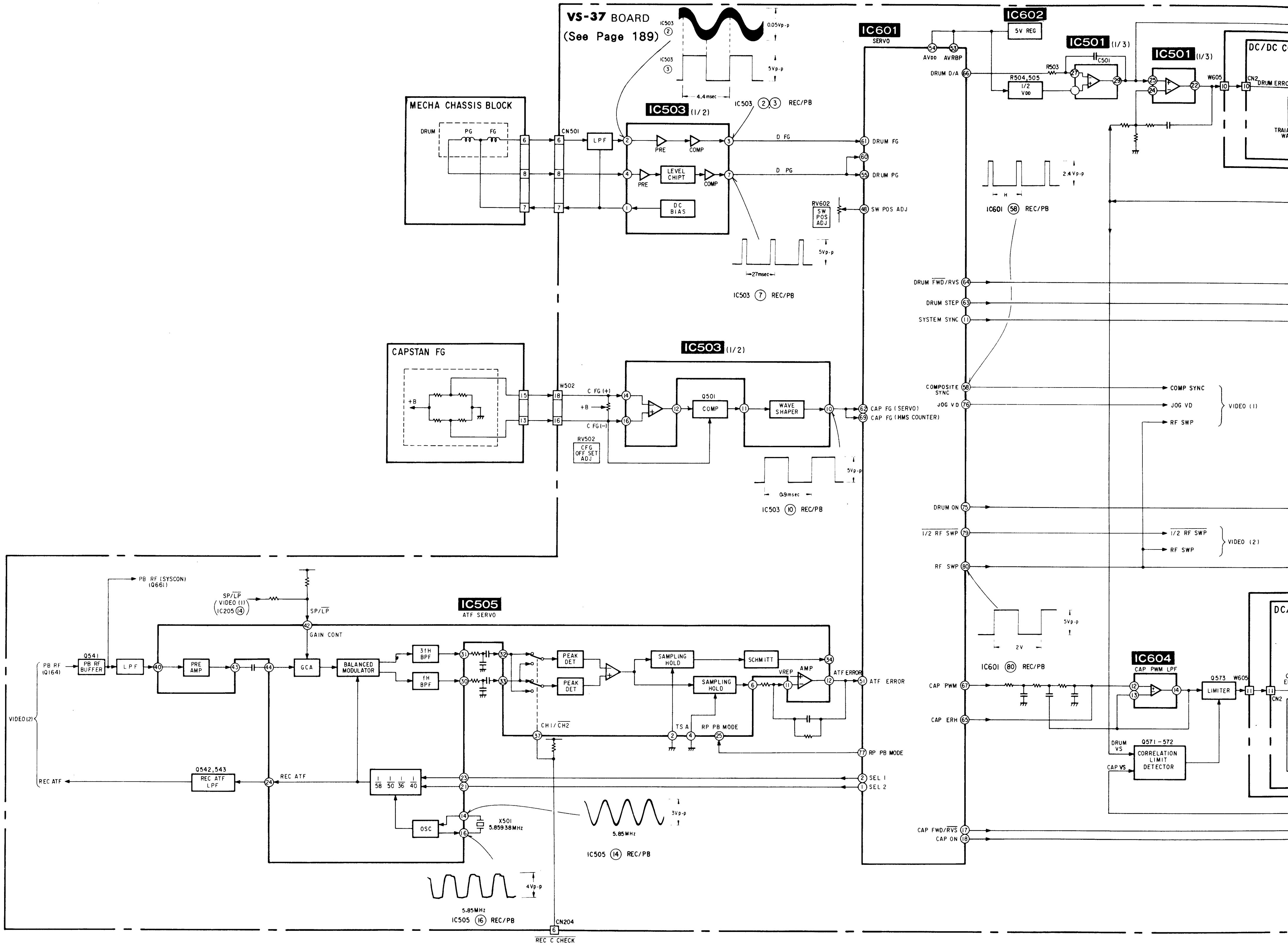

VS-37 BOARD
(See Page 167)
VIDEO HEAD CH-1A
VIDEO HEAD CH-1B
VIDEO HEAD CH-2A
VIDEO HEAD CH-2B
FLYING ERASE HEAD
CN101
Q105
CH-1A PB MUTING
Q106
CH-1B PB MUTING
Q102
CH-2A PB MUTING
Q101
CH-2B PB MUTING
DUMPING
TP101 CHECK LAND
TP103 CHECK LAND
TP102 CHECK LAND
TP104 CHECK LAND
Q107
CH-1A REC SW
Q108
CH-1B REC SW
Q104
CH-2A REC SW
Q103
CH-2B REC SW
RV101 REC C CH-1A
RV103 REC C CH-1B
RV102 REC C CH-2A
RV104 REC C CH-2B
CH-1A REC AMP
CH-1B REC AMP
CH-2A REC AMP
CH-2B REC AMP
IC102
CH-1 REC/PB AMP
IC101
CH-2 REC/PB AMP
VCA
ATF SW
NORMAL
MULTI
6dB AMP
LOGIC CONTROL
REC AFM
REC C
SP/LP
REC ATF
RP PB MODE
REC Y
REC 1A
REC 1B
REC 2A
REC 2B
PB 1A MUTE
PB 1B MUTE
PB 2A MUTE
PB 2B MUTE
RV111 PB EQ CH-1A
RV113 PB EQ CH-2B
RV112 PB EQ CH-2A
RV114 PB EQ CH-2B
CH-1A HEAD AMP
CH-1B HEAD AMP
CH-2A HEAD AMP
CH-2B HEAD AMP
9dB AMP
-6dB AMP
BPF
MIDDLE TUNE
PCM
MUTING
12dB AMP
GCA
RF AGC
DETECT
DOC DETECT
RF SWP
Q162
BUFFER
Q165
TIME CONSTANT SWITCH
Q164
TIME CONSTANT SWITCH
1/2 RF SWP
Q166
REC Y PB MUTING
TP161 CHECK LAND
TP161 REC
V 5mV/div
H 0.1μsec/div.
2.8Vp-p
IC101 ㉘, ㉝ REC / IC102 ㉘ ㉝ REC
0.6Vp-p
IC101 ⑯ PB
4.8Vp-p
2V
IC101 ⑪ REC/PB
IC102 ⑪ REC/PB
PB RF CH-1
PB RF CH-2
Q161
GAIN SWITCH
Q167
Q191,193
ERASE OSC
CN203
REC AFM RF
PB RF
AUDIO (AU-51)
PB 1A MUTE (IC601 ⑥)
REC 1A (IC601 ⑩)
SYSCON
REC Y RF (Q237 Ⓔ)
REC C RF (Q241 Ⓔ)
REC 1B (IC601 ⑧)
PB 1B MUTE (IC601 ④)
RP PB MODE (Q623)
SP/LP (IC205 ⑭)
PB RF
VIDEO (1)
JOG (IC205 ⑥)
DOC PULSE
PB RF
RF SWP (IC601 ⑳)
1/2 RF SWP (IC601 ⑲)
REC ATF (Q543)
SERVO
PB 2A MUTE (IC601 ⑤)
REC 2A (IC601 ⑨)
ME/MP (IC602 ⑫)
REC 2B (IC601 ⑦)
PB 2B MUTE (IC601 ③)
FE ON (IC601 ⑱)
SYSCON
CN204
PB RF CH1
PB RF CH2
RF SWP
1/2 RF SWP
TEST

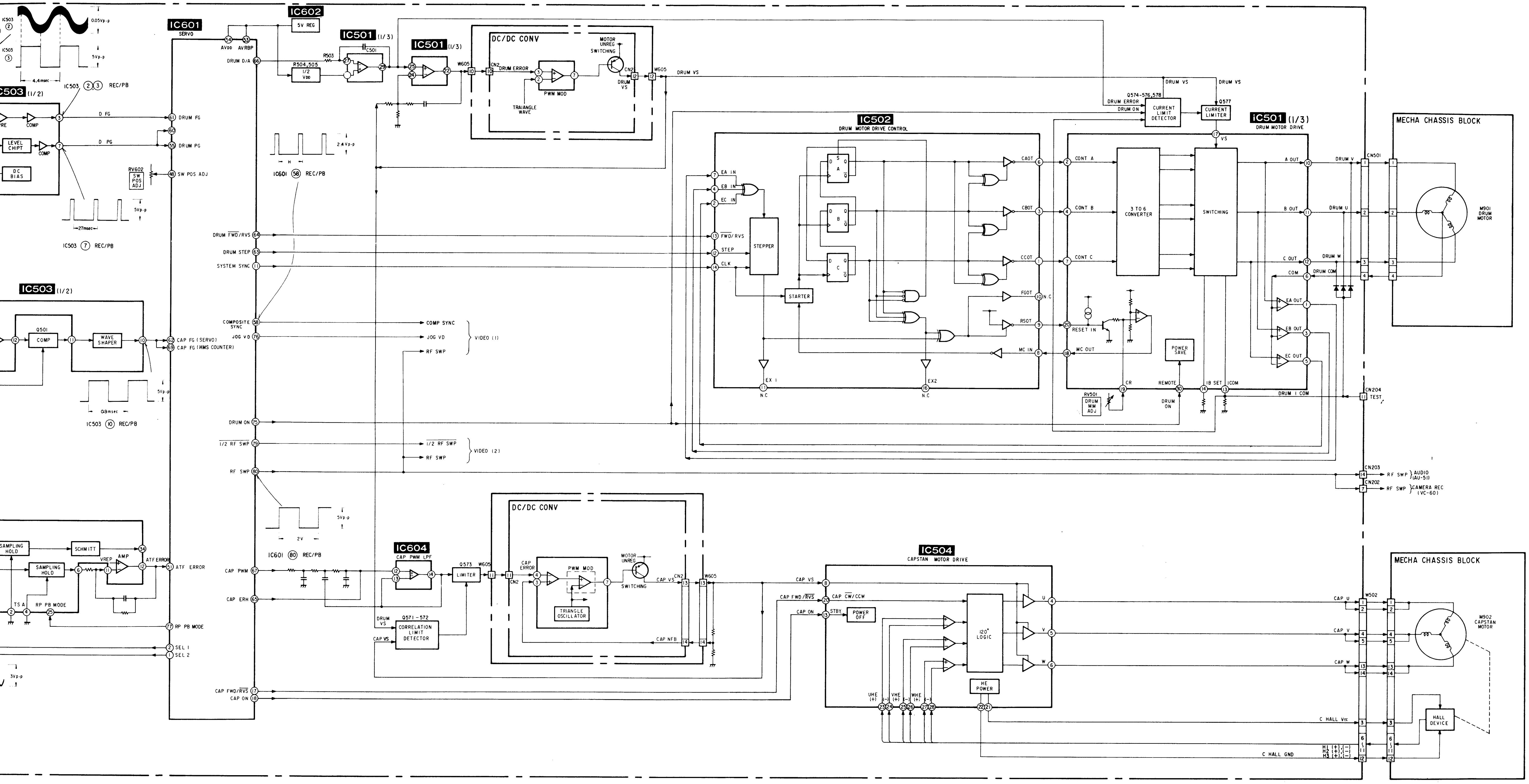
3-9. SERVO BLOCK DIAGRAM


PB RF (SYSCON) (Q661)
SP/LP (VIDEO (1)) (IC205 ⑭)
SP/LP
GAIN CONT
PB RF (Q164)
Q541
PB RF BUFFER
LPF
PRE AMP
GCA
BALANCED MODULATOR
VIDEO (2)
REC ATF
Q542,543
REC ATF LPF
REC ATF

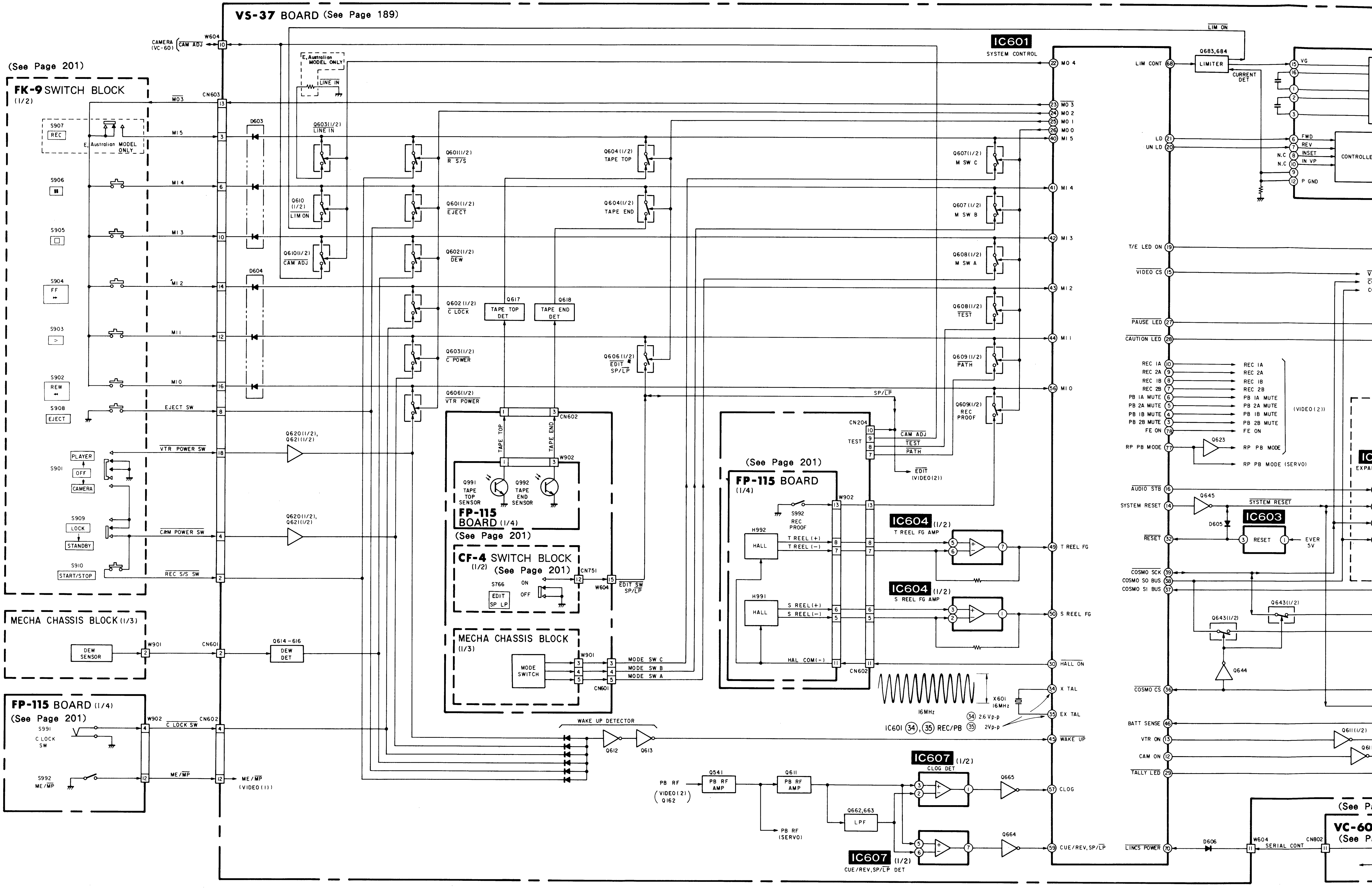

CN203
REC AFM RF
PB RF
AUDIO (AU-51)
SYSCON
REC Y RF (Q237(E))
REC C RF (Q241(E))
TP161 REC
SP/LP (IC205⑭)
VIDEO (1)
PB RF
JOG (IC205⑥)
DOC PULSE
PB RF
RF SWP (IC601(80))
SERVO
1/2 RF SWP (IC601(79))
REC ATF (Q543)
CN204
PB RF CH1
PB RF CH2
RF SWP
1/2 RF SWP
TEST
SYSCON

3-9. SERVO BLOCK DIAGRAM

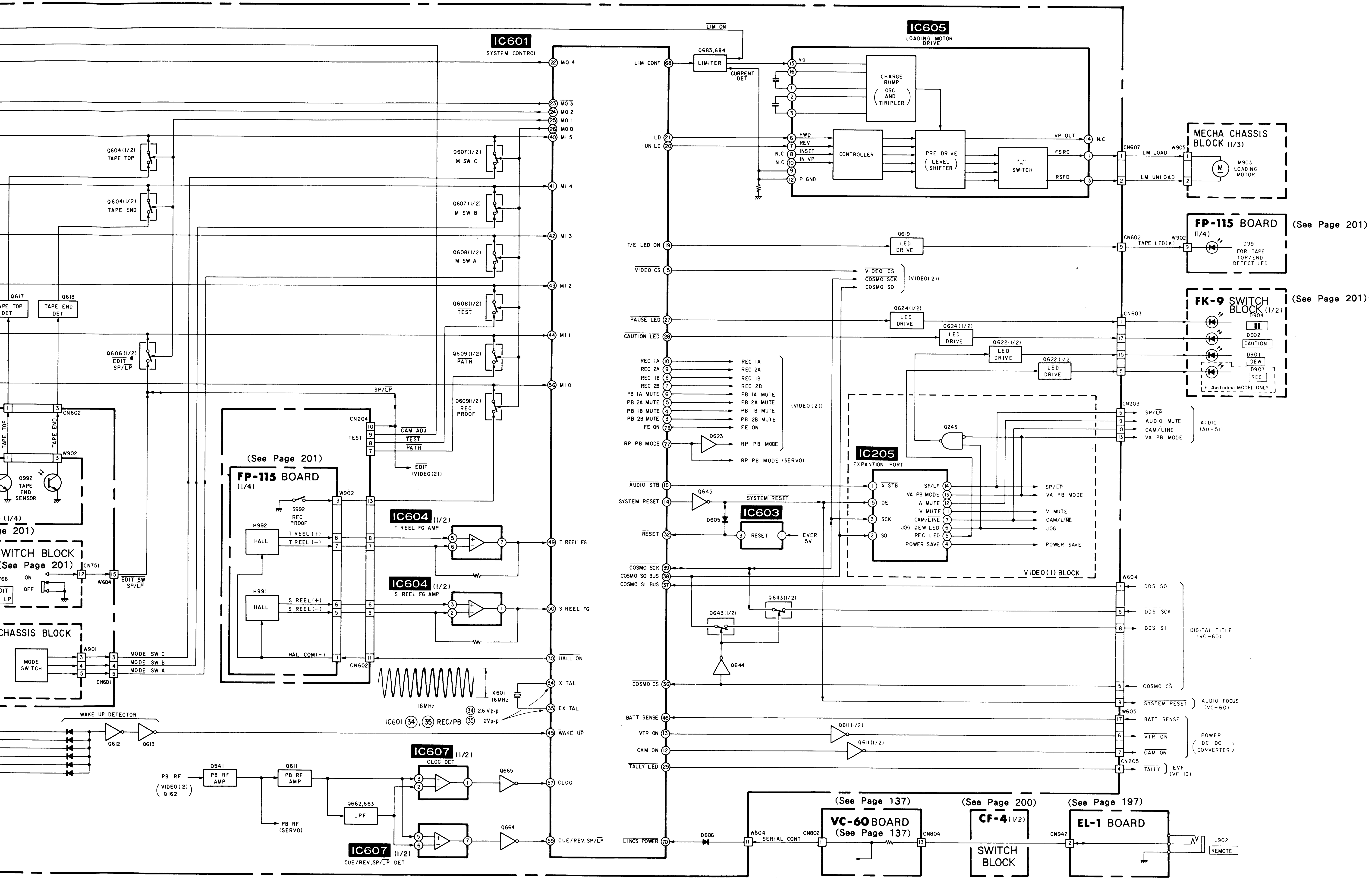

VS-37 BOARD
(See Page 189)
MECHA CHASSIS BLOCK
DRUM
PG
FG
CN501
LPF
IC503 (1/2)
PRE
COMP
LEVEL CHIPT
DC BIAS
D FG
D PG
IC503 ⑦ REC/PB
IC503 ②③ REC/PB
IC601
SERVO
DRUM FG
DRUM PG
RV602 SW POS ADJ
SW POS ADJ
IC602
5V REG
IC501 (1/3)
R504,505 1/2 VDD
DRUM D/A
AVDD
AVRBP
DC/DC C
DRUM ERROR
IC601 (56) REC/PB
DRUM FWD/RVS
DRUM STEP
SYSTEM SYNC
CAPSTAN FG
W502
C FG(+)
C FG(-)
RV502 CFG OFF SET ADJ
IC503 (1/2)
Q501 COMP
WAVE SHAPER
CAP FG (SERVO)
CAP FG (HMS COUNTER)
IC503 ⑩ REC/PB
COMPOSITE SYNC
JOG VD
COMP SYNC
JOG VD
RF SWP
VIDEO (1)
DRUM ON
1/2 RF SWP
RF SWP
VIDEO (2)
IC601 (80) REC/PB
IC505
ATF SERVO
PB RF (SYSCON) (Q661)
SP/LP VIDEO (1) (IC205⑭)
GAIN CONT
Q541 PB RF BUFFER
LPF
PRE AMP
GCA
BALANCED MODULATOR
31H BPF
fH BPF
PEAK DET
SAMPLING HOLD
SCHMITT
AMP
VREP
ATF ERROR
CH1/CH2
TS A
RP PB MODE
Q542,543 REC ATF LPF
REC ATF
OSC
X501 5.859398MHz
5.85MHz
IC505 ⑭ REC/PB
IC505 ⑯ REC/PB
SEL 1
SEL 2
CN204
REC C CHECK
CAP PWM
CAP ERR
IC604
CAP PWM LPF
Q573
LIMITER
DRUM VS
CAP VS
Q571-572 CORRELATION LIMIT DETECTOR
CAP FWD/RVS
CAP ON
VIDEO(2)
PB RF (Q164)
REC ATF


IC601
SERVO
IC602
5V REG
IC501 (1/3)
IC501 (1/3)
DC/DC CONV
MOTOR UNREG
SWITCHING
DRUM ERROR
PWM MOD
TRAIANGLE WAVE
DRUM VS
W605
CN2
R504,505
1/2 VDD
R503
C501
AVDD AVRBP
DRUM D/A
IC503 ②③ REC/PB
IC503 (1/2)
0.05Vp-p
5Vp-p
4.4msec
D FG
D PG
DRUM FG
DRUM PG
LEVEL CHIPT
COMP
DC BIAS
RV602 SW POS ADJ
SW POS ADJ
27msec
IC503 ⑦ REC/PB
2.4Vp-p
H
IC601 (58) REC/PB
DRUM FWD/RVS
DRUM STEP
SYSTEM SYNC
COMPOSITE SYNC
JOG VD
COMP SYNC
JOG VD
RF SWP
VIDEO (1)
IC503 (1/2)
Q501
COMP
WAVE SHAPER
CAP FG (SERVO)
CAP FG (HMS COUNTER)
0.9msec
IC503 ⑩ REC/PB
DRUM ON
1/2 RF SWP
1/2 RF SWP
RF SWP
VIDEO (2)
RF SWP
2V
IC601 (80) REC/PB
SAMPLING HOLD
SCHMITT
SAMPLING HOLD
VREP
AMP
ATF ERROR
ATF ERROR
TS A
RP PB MODE
RP PB MODE
SEL 1
SEL 2
CAP PWM
CAP ERR
CAP FWD/RVS
CAP ON
IC604
CAP PWM LPF
Q573
LIMITER
W605
DC/DC CONV
CAP ERROR
PWM MOD
MOTOR UNREG
SWITCHING
CAP VS
TRIANGLE OSCILLATOR
CAP NFB
DRUM VS
CAP VS
Q571-572
CORRELATION LIMIT DETECTOR
IC502
DRUM MOTOR DRIVE CONTROL
EA IN
EB IN
EC IN
FWD/RVS
STEP
CLK
STEPPER
STARTER
S D Q A
D B Q
D C Q
CAOT
CBOT
CCOT
FGOT
RSOT
MC IN
EX 1
EX2
N.C
Q574-576,578
DRUM ERROR
DRUM ON
CURRENT LIMIT DETECTOR
Q577
CURRENT LIMITER
DRUM VS
IC501 (1/3)
DRUM MOTOR DRIVE
VS
CONT A
CONT B
CONT C
3 TO 6 CONVERTER
SWITCHING
A OUT
B OUT
C OUT
COM
EA OUT
EB OUT
EC OUT
RESET IN
MC OUT
POWER SAVE
CR
REMOTE
IB SET
ICOM
RV501 DRUM MM ADJ
DRUM ON
DRUM V
DRUM U
DRUM W
DRUM COM
DRUM I COM
CN501
MECHA CHASSIS BLOCK
M901 DRUM MOTOR
CN204 TEST
CN203
RF SWP AUDIO (AU-51)
CN202
RF SWP CAMERA REC (VC-60)
IC504
CAPSTAN MOTOR DRIVE
CAP VS
CAP FWD/RVS
CAP CW/CCW
CAP ON
STBY
POWER OFF
120° LOGIC
HE POWER
UHE (+) (-)
VHE (+) (-)
WHE (+) (-)
CAP U
CAP V
CAP W
W502
MECHA CHASSIS BLOCK
M902 CAPSTAN MOTOR
HALL DEVICE
C HALL Vcc
C HALL GND
H1 (+) (-)
H2 (+) (-)
H3 (+) (-)

3-10. SYSYTEM CONTROL BLOCK DIAGRAM



VS-37 BOARD (See Page 189)
IC601
SYSTEM CONTROL
(See Page 201)
FK-9 SWITCH BLOCK (1/2)
S907 REC
E, Australian MODEL ONLY
S906
S905
S904 FF
S903
S902 REW
S908 EJECT
S901 PLAYER OFF CAMERA
S909 LOCK STANDBY
S910 START/STOP
CAMERA (VC-60) CAM ADJ
W604
CN603
MO3
MI5
MI4
MI3
MI2
MI1
MI0
EJECT SW
VTR POWER SW
CAM POWER SW
REC S/S SW
D603
D604
E, Australian MODEL ONLY
LINE IN
Q603(1/2) LINE IN
Q610 (1/2) LIM ON
Q610(1/2) CAM ADJ
Q601(1/2) R S/S
Q601(1/2) EJECT
Q602(1/2) DEW
Q602(1/2) C LOCK
Q603(1/2) C POWER
Q606(1/2) VTR POWER
Q604(1/2) TAPE TOP
Q604(1/2) TAPE END
Q606(1/2) EDIT SP/LP
Q617 TAPE TOP DET
Q618 TAPE END DET
Q607(1/2) M SW C
Q607(1/2) M SW B
Q608(1/2) M SW A
Q608(1/2) TEST
Q609(1/2) PATH
Q609(1/2) REC PROOF
Q620(1/2), Q621(1/2)
CN602
TAPE TOP
TAPE END
W902
Q991 TAPE TOP SENSOR
Q992 TAPE END SENSOR
FP-115 BOARD (1/4)
(See Page 201)
CF-4 SWITCH BLOCK (1/2) (See Page 201)
S766 EDIT SP LP
ON
OFF
CN751
EDIT SW SP/LP
MECHA CHASSIS BLOCK (1/3)
MODE SWITCH
W901
CN601
MODE SW C
MODE SW B
MODE SW A
MECHA CHASSIS BLOCK (1/3)
DEW SENSOR
Q614-616 DEW DET
FP-115 BOARD (1/4)
(See Page 201)
S991 C LOCK SW
S992 ME/MP
C LOCK SW
ME/MP
ME/MP (VIDEO(1))
WAKE UP DETECTOR
Q612
Q613
SP/LP
CN204
TEST
CAM ADJ
TEST
PATH
EDIT (VIDEO(2))
(See Page 201)
FP-115 BOARD (1/4)
S992 REC PROOF
H992 HALL
H991 HALL
T REEL (+)
T REEL (−)
S REEL (+)
S REEL (−)
HAL COM(−)
CN602
IC604 (1/2) T REEL FG AMP
IC604 (1/2) S REEL FG AMP
X601 16MHz
16MHz
IC601 (34), (35) REC/PB (34) 2.6Vp-p (35) 2Vp-p
PB RF (VIDEO(2) Q162)
Q541 PB RF AMP
Q611 PB RF AMP
Q662,663 LPF
PB RF (SERVO)
IC607 (1/2) CLOG DET
IC607 (1/2) CUE/REV,SP/LP DET
Q665
Q664
MO4
MO3
MO2
MO1
MO0
MI5
MI4
MI3
MI2
MI1
MI0
T REEL FG
S REEL FG
HALL ON
X TAL
EX TAL
WAKE UP
CLOG
CUE/REV,SP/LP
LIM ON
LIM CONT
Q683,684 LIMITER
CURRENT DET
LD
UN LD
VG
FWD
REV
INSET
IN VP
N.C
P GND
CONTROLLE
T/E LED ON
VIDEO CS
PAUSE LED
CAUTION LED
REC 1A
REC 2A
REC 1B
REC 2B
PB 1A MUTE
PB 2A MUTE
PB 1B MUTE
PB 2B MUTE
FE ON
RP PB MODE
Q623
RP PB MODE (SERVO)
(VIDEO(2))
AUDIO STB
SYSTEM RESET
Q645
D605
IC603
RESET
EVER 5V
COSMO SCK
COSMO SO BUS
COSMO SI BUS
Q643(1/2)
Q644
COSMO CS
BATT SENSE
VTR ON
CAM ON
TALLY LED
Q611(1/2)
LINCS POWER
D606
W604
SERIAL CONT
CN802
VC-60
(See P
EXPA


IC601
SYSTEM CONTROL
MO 4
MO 3
MO 2
MO 1
MO 0
MI 5
MI 4
MI 3
MI 2
MI 1
MI 0
T REEL FG
S REEL FG
HALL ON
X TAL
EX TAL
WAKE UP
CLOG
CUE/REV, SP/LP
LIM CONT
LD
UN LD
T/E LED ON
VIDEO CS
PAUSE LED
CAUTION LED
REC 1A
REC 2A
REC 1B
REC 2B
PB 1A MUTE
PB 2A MUTE
PB 1B MUTE
PB 2B MUTE
FE ON
RP PB MODE
AUDIO STB
SYSTEM RESET
RESET
COSMO SCK
COSMO SO BUS
COSMO SI BUS
COSMO CS
BATT SENSE
VTR ON
CAM ON
TALLY LED
LINCS POWER
LIM ON
Q683,684
LIMITER
CURRENT DET
IC605
LOADING MOTOR DRIVE
VG
CHARGE RUMP
OSC AND TIRIPLER
FWD
REV
INSET
IN VP
N.C
P GND
CONTROLLER
PRE DRIVE
LEVEL SHIFTER
"H" SWITCH
VP OUT
FSRD
RSFD
N.C
CN607
LM LOAD
LM UNLOAD
W905
MECHA CHASSIS BLOCK (1/3)
M903 LOADING MOTOR
FP-115 BOARD (1/4)
(See Page 201)
CN602
TAPE LED(K)
W902
D991 FOR TAPE TOP/END DETECT LED
Q619 LED DRIVE
VIDEO CS
COSMO SCK
COSMO SO
(VIDEO(2))
FK-9 SWITCH BLOCK (1/2)
(See Page 201)
CN603
Q624(1/2) LED DRIVE
Q622(1/2) LED DRIVE
D904
D902 CAUTION
D901 DEW
D903 REC
E, Australian MODEL ONLY
CN203
SP/LP
AUDIO MUTE
CAM/LINE
VA PB MODE
AUDIO (AU-51)
Q243
IC205
EXPANTION PORT
A.STB
OE
SCK
SO
SP/LP
VA PB MODE
A MUTE
V MUTE
CAM/LINE
JOG DEW LED
REC LED
POWER SAVE
SP/LP
VA PB MODE
V MUTE
CAM/LINE
JOG
POWER SAVE
VIDEO(1) BLOCK
Q623
RP PB MODE
RP PB MODE (SERVO)
Q645
SYSTEM RESET
IC603
RESET
D605
EVER 5V
Q643(1/2)
Q643(1/2)
Q644
W604
DDS SO
DDS SCK
DDS SI
DIGITAL TITLE (VC-60)
COSMO CS
SYSTEM RESET
AUDIO FOCUS (VC-60)
W605
BATT SENSE
VTR ON
CAM ON
POWER DC-DC CONVERTER
Q611(1/2)
Q611(1/2)
CN205
TALLY
EVF (VF-19)
D606
W604
SERIAL CONT
CN802
VC-60 BOARD
(See Page 137)
CN804
CF-4 (1/2)
SWITCH BLOCK
(See Page 200)
EL-1 BOARD
(See Page 197)
CN942
J902 REMOTE
Q604(1/2) TAPE TOP
Q604(1/2) TAPE END
Q606(1/2) EDIT SP/LP
Q607(1/2) M SW C
Q607(1/2) M SW B
Q608(1/2) M SW A
Q608(1/2) TEST
Q609(1/2) PATH
Q609(1/2) REC PROOF
Q617 TAPE TOP DET
Q618 TAPE END DET
SP/LP
CN204
TEST
CAM ADJ
TEST
PATH
EDIT (VIDEO(2))
CN602
TAPE TOP
TAPE END
W902
Q992 TAPE END SENSOR
(1/4)
201)
SWITCH BLOCK
(See Page 201)
CN751
ON
OFF
EDIT SW SP/LP
W604
CHASSIS BLOCK
W901
MODE SWITCH
CN601
MODE SW C
MODE SW B
MODE SW A
FP-115 BOARD (1/4)
(See Page 201)
S992 REC PROOF
H992 HALL
T REEL (+)
T REEL (-)
H991 HALL
S REEL (+)
S REEL (-)
HAL COM(-)
W902
CN602
IC604 (1/2)
T REEL FG AMP
IC604 (1/2)
S REEL FG AMP
16MHz
X601 16MHz
IC601 34, 35 REC/PB
34 2.6 Vp-p
35 2Vp-p
WAKE UP DETECTOR
Q612
Q613
PB RF
(VIDEO(2) Q162)
Q541 PB RF AMP
Q611 PB RF AMP
PB RF (SERVO)
Q662,663 LPF
IC607 (1/2)
CLOG DET
Q665
Q664
IC607 (1/2)
CUE/REV, SP/LP DET

3-11. SYSTEM CONTROL SECTION FUNCTION DESCRIPTION

The system control section consists of following four microcomputers:

- Mode/mechanism control microcomputer CXP80116
- DDS microcomputer μPD7503GF
- EVR microcomputer MC68HC05N4FU
- AF microcomputer MC68HC05C4FU

3-11-1. Mode/Mechanism Control Microcomputer CXP80116 (IC601 on VS-37 Board)

1. Function description

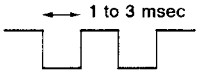
1) Power ON/OFF control
2) Key matrix read
   (Playback, Record, Fast-forward, Rewind, Pause, Stop, VIDEO/CAMERA Power Supply, Cassette Eject, START/STOP)
3) Servo
4) Loading motor control
5) Error detection
   - Battery end/pre-end
   - Tape end
   - No cassette
   - Erasure prevention
   - DEW (condensation)
   - PAUSE release
   - CLOG (head clog)
   - L.MOTOR EMERGENCY
   - Drum rotation
   - Drum phase
   - Reel rotation
   - Capstan rotation
   - Drum/capstan start
6) H.M.S. counter
7) JOG VD insertion
8) Execution of various modes

2. Abbreviated specifications

- 8-bit high-speed, highly integrated single chip microcomputer
- A/D converter, 8-bit, 8-channel
- Serial interface
- Time/counter
- Time base timer
- Vector interrupts
- High precision timing pattern generation function (high-speed output)
- PWM/DA gate pulse output, 12-bit, 2-channel
- High precision measurement function (FRC) for servo signals
- Power on reset function
- Sleep and stop functions
- External memory expansion mode, microprocessor mode
- ROM: 16 Kbytes
- RAM: 352 Kbytes
- Speed: 500 ns
- Process: C MOS
- Operating voltage: 4.5 to 5.5V
- Package: 80-pin flat package

3. Terminal function (CXP80116)

<table>
<tr><th>Pin No.</th><th>Signal Name</th><th>I/O</th><th colspan="2">Function</th><th>Connection</th></tr>
<tr><td>1</td><td>SEL 2</td><td>O</td><td colspan="2" rowspan="2">ATF REF PILOT signal frequency (f1 to f4) selecting signal. (*1)<table><tr><td>ATF REF PILOT</td><td>f1</td><td>f2</td><td>f3</td><td>f4</td></tr><tr><td>SEL 1</td><td>H</td><td>L</td><td>H</td><td>L</td></tr><tr><td>SEL 2</td><td>H</td><td>H</td><td>L</td><td>L</td></tr></table></td><td rowspan="2">To ATF servo IC (IC505: CXA1204Q)</td></tr>
<tr><td>2</td><td>SEL 1</td><td>O</td></tr>
<tr><td>3</td><td>PB 2B MUTE</td><td>O</td><td colspan="2" rowspan="4">Crosstalk from the other heads prevention control signal during playback.
Mute by "H". (*1)</td><td rowspan="4">To REC/PB amp (IC101, IC102)</td></tr>
<tr><td>4</td><td>PB 1B MUTE</td><td>O</td></tr>
<tr><td>5</td><td>PB 2A MUTE</td><td>O</td></tr>
<tr><td>6</td><td>PB 1A MUTE</td><td>O</td></tr>
<tr><td>7</td><td>$\overline{\text{REC 2B}}$</td><td>O</td><td colspan="2" rowspan="4">Drum head (1A, 2A, 1B, 2B) switching recording timing signal.
REC by "L". (*1).</td><td rowspan="4">To REC/PB amp (IC101, IC102)</td></tr>
<tr><td>8</td><td>$\overline{\text{REC 1B}}$</td><td>O</td></tr>
<tr><td>9</td><td>$\overline{\text{REC 2A}}$</td><td>O</td></tr>
<tr><td>10</td><td>$\overline{\text{REC 1A}}$</td><td>O</td></tr>
<tr><td>11</td><td>SYSTEM SYNC</td><td>O</td><td colspan="2">INT-V signal for drum servo. Used as a clock during step start with drum driver IC CXA1206. (*1)</td><td>Drum servo IC (Pin ⑭ of IC502)</td></tr>
<tr><td>12</td><td>CAM ON</td><td>O</td><td colspan="2">Camera DC/DC converter on/off signal. "H" when power of camera is turned on.</td><td>To DC/DC converter</td></tr>
<tr><td>13</td><td>VTR ON</td><td>O</td><td colspan="2">VTR DC/DC converter on/off signal. "H" when power of camera or video is turned on.</td><td>To DC/DC converter</td></tr>
<tr><td>14</td><td>SYSTEM RESET</td><td>O</td><td colspan="2">Reset AF microcomputer during Power ON, and input to video/audio extension port (IC205) to mute audio signal during Power ON.</td><td>Pin ⑨ of IC612 and Pin (60) of IC613 on VC-60 board, Pin ⑮ of IC205 on VS-37 board.</td></tr>
<tr><td>15</td><td>$\overline{\text{VIDEO CS}}$</td><td>O</td><td colspan="2">Selecting signal to video IC, CXA1200Q and CXA1201Q of internal bus signal. Select by "L".</td><td>Pin ㉑ of IC201
Pin ⑰ of IC202</td></tr>
<tr><td>16</td><td>$\overline{\text{AUDIO STB}}$</td><td>O</td><td colspan="2">Data strobe signal to video/audio extension port (IC205) of internal bus communication. Latch by _|‾.</td><td>Pin ① of IC205</td></tr>
<tr><td>17</td><td>CAP FWD/$\overline{\text{RVS}}$</td><td>O</td><td colspan="2">Capstan rotation direction control signal.
FWD by "H", RVS by "L". (*1)</td><td>Pin ⑳ of IC504</td></tr>
<tr><td>18</td><td>CAP ON</td><td>O</td><td colspan="2">Capstan driver ON control signal. Capstan ON by "H". (*1)</td><td>Pin ⑬ of IC504</td></tr>
<tr><td>19</td><td>T/E LED ON</td><td>O</td><td colspan="2">TAPE top/end LED driving signal.</td><td>Q619Ⓑ</td></tr>
<tr><td>20</td><td>UNLOAD</td><td>O</td><td colspan="2" rowspan="2">Loading motor control signal<table><tr><td>Conditions / Signals</td><td>OFF</td><td>LOADING</td><td>UN-LOADING</td><td>BRAKE</td></tr><tr><td>LOAD</td><td>L</td><td>H</td><td>L</td><td>H</td></tr><tr><td>UNLOAD</td><td>L</td><td>L</td><td>H</td><td>H</td></tr></table></td><td>Pin ⑦ of IC605</td></tr>
<tr><td>21</td><td>LOAD</td><td>O</td><td>Pin ⑥ of IC605</td></tr>
<tr><td>22</td><td>MO4</td><td>O</td><td colspan="2" rowspan="5">Only Matrix output $\overline{\text{MO3}}$ is "L" active.
Only $\overline{\text{MO3}}$ is "L" pulse output, the other ports are "H" pulse output.</td><td rowspan="5"></td></tr>
<tr><td>23</td><td>$\overline{\text{MO3}}$</td><td>O</td></tr>
<tr><td>24</td><td>MO2</td><td>O</td></tr>
<tr><td>25</td><td>MO1</td><td>O</td></tr>
<tr><td>26</td><td>MO0</td><td>O</td></tr>
<tr><td>27</td><td>$\overline{\text{PAUSE LED}}$</td><td>O</td><td>PAUSE LED control signal. "L" when PAUSE LED is lit.</td><td rowspan="3">Middle withstand voltage (12V), Large current (12 mV) port.</td><td>Pin ② of Pause LED driver Q624</td></tr>
<tr><td>28</td><td>$\overline{\text{CAUTION LED}}$</td><td>O</td><td>CAUTION LED control signal. "L" when CAUTION LED is lit.</td><td>Pin ⑤ of Caution LED driver Q624</td></tr>
<tr><td>29</td><td>$\overline{\text{TALLY LED}}$</td><td>O</td><td>External TALLY LED and EVF internal TALLY drive. "L" when TALLY LED is lit.</td><td>TALLY LED</td></tr>
</table>

Pin No.	Signal Name	I/O	Function	Connection
30	$\overline{\text{HALL ON}}$	O	Reel FG hole element. Drive, middle withstand voltage and large current port. 	Reel sensor
31	MP	I	Microcomputer processor mode selecting pin → unselecting.	GND
32	$\overline{\text{RESET}}$	I	Reset input. "L" active.	Pin ③ of reset IC IC603
33	V_{SS}		GND	GND
34	XTAL	O	Crystal connecting pin for system clock oscillation. Oscillation at: 16 MHz.	Oscillation crystal X601
35	EXTAL	I		
36	$\overline{\text{COSMO CS}}$	I	Selecting signal from DDS microcomputer of internal bus communication to mode/mechanism control. Selected by "L".	DDS microcomputer Pin ⑭ of IC561 on VC-60 board
37	COSMO SI BUS	I	Serial data input pin.	
38	COSMO SO BUS	O	Serial data output pin.	
39	$\overline{\text{COSMO SCK}}$	I/O	Input/output pin for serial clock.	
40	MI 5	I	Matrix input.	
41	MI 4			
42	MI 3			
43	MI 2			
44	MI 1			
45	$\overline{\text{WAKE UP}}$	I	STBY release input. Released by "L".	
46	BATT SENSE	I	Battery end/pre-end voltage input. A/D input pin.	Inside BATT END ADJ DC-DC converter
47	N.C.			
48	SW POS ADJ	I	Switching position adjustment input (Test mode). A/D input pin	SW POS ADJ RV602
49	T REEL FG	I	T-reel/S-reel FG input. A/D input pin.	Pin ⑦ of IC604
50	S REEL FG	I		Pin ① of IC604
51	ATF ERROR	I	ATF error (ATF LOCK error)input. A/D input pin.	Pin ⑫ of ATF IC IC505
52	AV_{SS}		A/D converter GND pin.	GND
53	AV_{REF}	I	A/D converter reference voltage input pin	Pin ① of regulator IC IC602 for EVER 5V
54	AV_{DD}		A/D converter positive power supply pin	
55	DRUM PG	I	DRUM PG input. FRC (High precision timer)capture input pin.	Pin ⑦ of Sense amp IC503
56	MI 0	I	Matrix input	
57	CLOG	I	Clog detection signal input. Clog by "H".	Q665 Ⓒ
58	COMPOSITE SYNC	I	Composite sync signal input (Incorporated V SYNC separator)	Pin ⑭ of VIDEO IC IC201
59	CUE/REV SP/$\overline{\text{LP}}$	I	SP/LP discrimination signal input when CUE/REV, etc. "H" when SP mode, "L" when LP mode.	Q664 Ⓒ
60	DRUM PG	I	Not used.	Pin ⑦ of Sense amp IC503
61	DRUM FG	I	DRUM FG input pin. FRC capture input pin.	Pin ③ of Sense amp IC503
62	CAP FG	I	CAPSTAN FG input pin. FRC capture input pin.	Pin ⑩ of Sense amp IC503

Pin No.	Signal Name	I/O	Function	Connection
63	DRUM STEP	O	Step mode control signal of drum motor driver. "H" when drum start.	Pin ⑫ of IC502
64	DRUM $\overline{\mathrm{FWD}}$/RVS	O	DRUM rotation direction control signal. RVS by "H", FWD by "L".	Pin ⑬ of IC502
65	CAP ERH	O	H level output pin to set capstan error to maximum level when capstan start and stop.	Pin ⑫ of IC604
66	DRUM D/A	O	DA gate pulse output pin to output DRUM error. Exclusive servo output pin (DA mode).	
67	CAP PWM	O	PWM output pin servo exclusive output pin to output cap error (PWM mode)	
68	LIM CONT	O	Loading motor current limiter control signal so as to prevent fingers from being nipped. Limiter ON by "H".	
69	CAP FG	I	External event input pin to Cap FG input pin exclusive counter for Tape counter drive	Pin ⑩ of Sense amp IC503
70	$\overline{\mathrm{LINCS\ POWER}}$	I	Input for release microcomputer standby to turn on the unit from external with remote commander.	Remote jack Pin ② of J902 on EL-1 board
71	$\overline{\mathrm{NMI}}$	I	Non-maskable interrupt request pin. NMI is not used.	EVER 5V
72	V_{DD}		Positive power supply pin	EVER 5V
73	V_{SS}		GND pin.	GND
74	V_{PP}		N.C.	EVER 5V
75	DRUM ON	O	DRUM driver ON control signal.	Pin ㉚ of IC501
76	JOG VD	O	Insert to VIDEO signal when variable speed playback. Simulated VD output pin. (*1)	Pin ⑤ of IC201
77	RP PB MODE	O	Switching signals for REC/PB amplifier and REC/PB mode of ATF IC. (*1)	ATF IC Pin ㉕ of IC505 REC/PB amp (IC101, IC102)
78	$\overline{\mathrm{FE\ ON}}$	O	Flying erase oscillation ON/OFF signal. Oscillating by "L". (*1)	Flying erase oscillation circuit
79	$\overline{\mathrm{1/2\ RF\ SWP}}$	O	1/2 RF SWP output pin. (*1)	REC/PB amp
80	RF SWP	O	RF SWP output pin. (*1)	REC/PB amp Video system

*1: High precision real time pattern output and high precision real time pulse output terminal

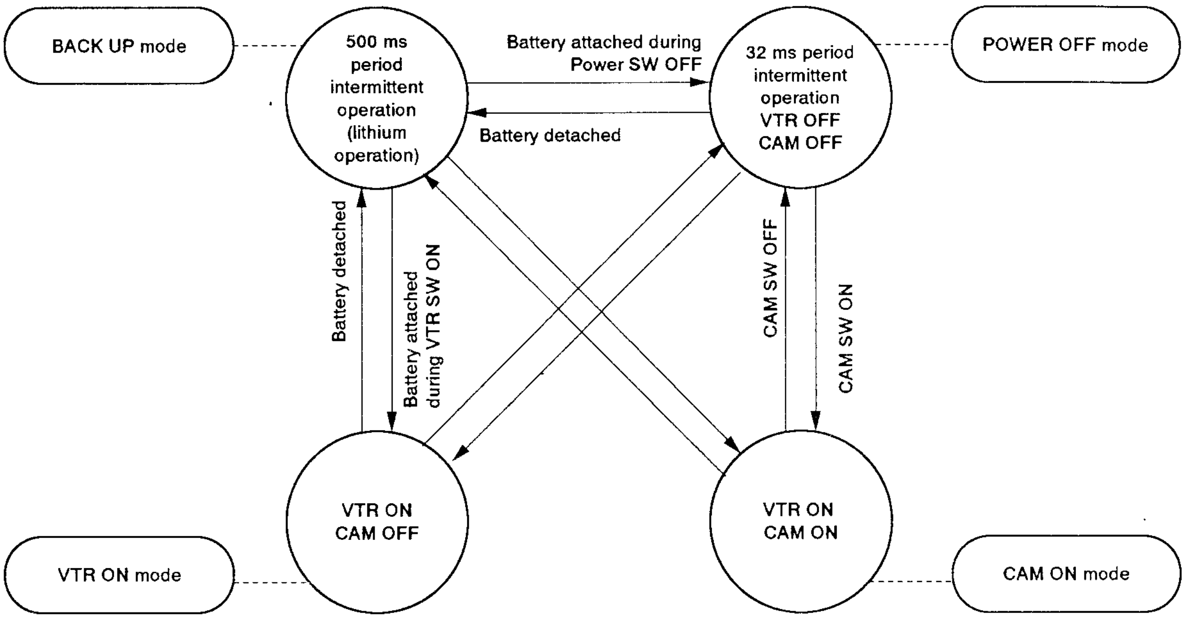
3-11-2. DDS microcomputer μPD7503GF (IC561 on VC-60 Board)

1. Function description

1) Internal data communication control
2) Date/time measurement
3) LCD indication
4) Reading of key matrix
   (White balance, electronic shutter, edit search +/-, auto-lock, focus mode, counter reset, zero memory, title, store, color/mode, backlight compensation, date/forward, time/set, fader)

2. Operation modes

- As shown in the chart below, the operation mode is shifted according to the position of the power switch (camera/off/video) and whether or not there is a main battery.



BACK UP mode
500 ms period intermittent operation (lithium operation)
Battery attached during Power SW OFF
Battery detached
32 ms period intermittent operation VTR OFF CAM OFF
POWER OFF mode
Battery detached
Battery attached during VTR SW ON
CAM SW OFF
CAM SW ON
VTR ON CAM OFF
VTR ON CAM ON
VTR ON mode
CAM ON mode

- **The main DDS microcomputer functions in each mode is as follows.**

Mode	Main Battery	Power Switch	Microcomputer power supply	Clock Mode	LCD	EVF	Main Functions
BACK UP	No	Camera/ off/ video	LI 3V (Lithium battery)	500 ms period intermittent oscillation	–	–	• Backup of title and tape counter data • Clock count operation
POWER OFF	Yes	Off	EVER 5V (Main battery)	32 ms period intermittent oscillation	○	○	• Counter/date/time indication to LCD • Date/time set function (Zero memory and counter reset are invalid.)
VTR ON	Yes	Video	EVER 5V + SS 5V (Main battery)	Continuous oscillation	○	○	• Serial communication with EVR and mode/mechanism control microcomputer • Indication to LCD • Acceptance of zero memory and counter reset keys
CAM ON	Yes	Camera	EVER 5V + SS 5V (Main battery)	Continuous oscillation	○	–	• VTR ON functions and all camera features • Indication control for white balance, focus, titles, electronics shutter, etc. • Indication to EVF and LCD

3. Terminal function and Input/output level (μPD7503GF)

Pin No.	Signal Name	I/O	Functions and I/O Level
1	———	–	
2	$\overline{\text{CMO 2}}$	O	Key matrix output signal. "L" pulse of 22 ms (VTR mode) or 1V period (camera mode).
3	$\overline{\text{CMO 1}}$	O	
4	$\overline{\text{CMO 0}}$	O	
5	DDS SI	I	Serial communication and data input. V period "L" pulse train.
6	DDS SO	O	Serial communication and data output. V period "H" pulse train.
7	$\overline{\text{DDS SCK}}$	I/O	Serial communication and serial clock input/output. V period "L" pulse train.
8	$\overline{\text{TEST}}$	I	Test mode input. Normally "H".
9	$\overline{\text{LI PE}}$	I	Lithium battery pre-end detection. Normally "H". "L" when lithium battery voltage drops.
10	VTR PWR	I	SS 5V power detection. "H" when power on.
11	CG BUSY	I	Busy signal input from character generator. V period "H" pulse train.
12	CMO 4	O	Key matrix output signal. "H" pulse of 22 ms (VTR mode) or 1V period (camera mode).
13	$\overline{\text{EVR CS}}$	O	Chip select signal to EVR microcomputer (IC361 on VC-60 board). "L" pulse of 1V period.
14	$\overline{\text{COSMO CS}}$	O	Chip select signal to servo/system control microcomputer (IC601 on VS-37 board). "L" pulse of 1V period.
15	CG STB	O	Strobe signal for character generator. 1V period "H" pulse train.
16	TG STB	O	Strobe signal to timing generator (VC-60 board, DT-74 board). Camera mode: "H" pulse of 1V period. VTR mode: "L"
17	SRAM CS	O	Chip select signal to static RAM (IC801 on TI-15 board). VTR mode: "L" Camera mode: Normally "L". "H" during title operation.
18	TITLE CS	O	Chip select signal to title controller (IC803 on TI-15 board). VTR mode: "L" Camera mode: "H" pulse of 1V period.
19	LCD OFF	O	LCD indication ON/OFF control output. Normally "L" (0V). "H" (3V) when backed up by lithium battery.
20	X2	O	Crystal oscillation circuit for clock. Oscillation frequency is 32.768 kHz
21	X1	I	
23	VLC 3	I	LCD power supply 3 input pin. Normally 0V. 3V when backed up.
24	VLC 2	I	LCD power supply 2 input pin. Normally 1.7V. 3V when backed up.
25	VLC 1	I	LCD power supply 1 input pin. Normally 3.3V. 3V when backed up.
26	VDD	I	Power supply input pin.
27	COM 3	O	LCD remote control pin driving output 3. 4 values of 0, 1.7, 3.3, 5V outputs.
28	COM 2	O	LCD remote control pin driving output 2. 4 values of 0, 1.7, 3.3, 5V outputs.
29	COM 1	O	LCD remote control pin driving output 1. 4 values of 0, 1.7, 3.3, 5V outputs.
30	COM 0	O	LCD remote control pin driving output 0. 4 values of 0, 1.7, 3.3, 5V outputs.

Pin No.	Signal Name	I/O	Functions and I/O Level
31		I	
32 | 41	———	I	Not used
42 | 54	S12 | S0	O	LCD segment pin driving output, 12 to 0. 4 values of 0, 1.7, 3.3, 5V outputs.
55	INT 1	I	Interrupt input by camera VD. VTR mode: "H". Camera mode: "H" pulse of 1V period.
56	RESET	I	Normally "L".
57	CL 1	I	System clock oscillation pin. • When video power ON or camera power ON: Continuous oscillation (oscillation frequency approx. 330 kHz). • When power OFF: 32 ms period intermittent oscillation (oscillation frequency approx. 330 kHz) • When backed up by lithium battery: 500 ms period intermittent oscillation (oscillation frequency approx. 70 kHz).
59	CL 2	I	
58	VDD	O	Power supply input pin.
60	CMI 3	I	Key matrix input signal. Normally "H". When key input, "L" pulse of 22 ms (VTR mode) or 1V period (camera mode).
61	CMI 2	I	
62	CMI 1	I	
63	CMI 0	I	
64	$\overline{\text{COM 3}}$	I	Key matrix input signal. Normally "H". When key input, "L" pulse of 22 ms (VTR mode) or 1V period (camera mode).

3-11-3. EVR microcomputer MC68HC05N4FU (IC361 on VC-60 Board)

1. Function description

1) EVR control
2) Auto white balance control
3) Electronic shutter

2. Pin function and input/output level (MC68HC05N4FU)

Pin No.	Signal Name	I/O	Functions and I/O Level
1	——		——
2	$\overline{\text{SSW}}$	O	"H" only during communicating with serial switching D/A converter. "H" pulse of V period.
3	$\overline{\text{SCLK}}$	O	Serial clock output. V period "L" pulse train.
4	SI	I	Serial data input. V period "H" pulse train.
5	SO	O	Serial data output. V period "L" pulse train.
6	$\overline{\text{EVR CS}}$	I	Communication request from DDS. "L" pulse of V period.
7	L IN	I	LANC input. L: 0, H: 1. V period "H" pulse train.
8	L OUT	O	LANC output. L: 0, H: 1. V period "H" pulse train.
9	$\overline{\text{CAM ADJ}}$	I	NORMAL/ADJUST selection. Normally "H". "L" during adjustment.
10	FADER PWM	O	Fader control signal for CAMERA/AUDIO signal. Normally "L".
11	SSW	O	Serial signal switching. "L" pulse of V period.
12, 13	LD	O	Data load instruction to EVR (IC252, IC302). "H" pulse of V period.
14	$\overline{\text{BACK LIGHT}}$	O	"L" during backlight compensation ON.
15	MACRO	I	Control from AF microcomputer, Indoor (IN): H, outdoor (OUT): L according to brightness.
16	——		
17	V_{DD}		Connected to EVER 5V.
18			GND
19	——	–	
20	PAL/$\overline{\text{NTSC}}$	I	Broadcast system selection. L: NTSC, H: PAL.
21	GND		——
22	GND		——
23	GND		——
24, 25	GND		——
26	GND	–	——
27	GND	–	——
28	CAM 5V	I	Camera power on monitoring. L: CAM OFF, H: CAM ON.
29	AW IN	I	AWB A/D timer stop. Pattern drive interrupt. Normally V period pulse.
30	AW ADJ	O	AWB preset data fetch. Normally "L". "H" during auto white balance adjustment.
31	——	–	NC
32	——	–	——
33	——	–	——
34	S3SW	O	AWB measurement signal selection. "H" pulse of 3V period.
35	S2SW	O	AWB measurement signal selection. "H" pulse of 3V period.
36	DISCHG	O	Capacitor reset pulse for timer measurement lamp voltage generation. "H" pulse of V period.
37	——	–	——
38	S1SW	O	AWB measurement signal selection. "H" pulse of 3V period.
39	——	–	——
40	OSC2	O	Built-in inverter output for oscillation. Oscillation frequency: 4 MHz.
41	OSC1	I	Built-in inverter input for oscillation.
42	V_{DD}		Connected to EVER 5V.
43	——		——
44	$\overline{\text{RESET}}$		Normally "H". "L" when reset.
45	$\overline{\text{IRQ}}$		Connected to $\overline{\text{EVR CS}}$ signal. "L" pulse of V period.
46	——	–	Normally "H". "L" when reset.
47	——	–	Normally "H". "L" when reset.
48	$\overline{\text{A/D EN}}$	O	1-bit A/D converter operation ON/OFF output for titler. Normally "H". "L" for 7V period when SUPERIMPOSE MEMORY button (S762 on CF-4 board) pressed.

3-11-4. AF microcomputer MC68HC05C4FU (IC613 on VC-60 Board)

1. Function description

1) AF control
2) Power focus
3) Zoom motor drive

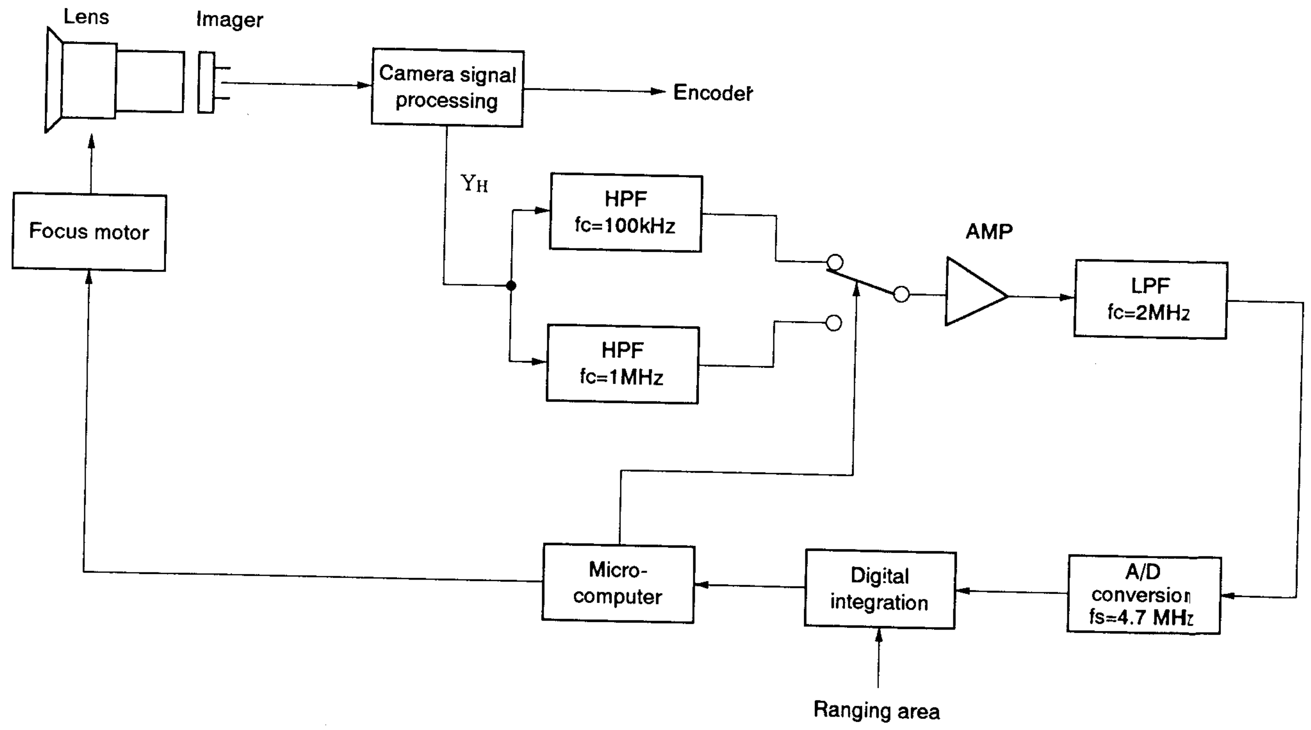
2. Auto focus system of this unit (A-AF: Image processing system)

The high frequency components of video signal (actually luminance signal) are microcomputer processed by TTL without using external sensors to control the focus).

3. Outline of operation

The frequency components from 100k to 2 MHz and from 1M to 2 MHz are extracted from the luminance (Y) signal, and these are digitally integrated for each field. This integration value is called the evaluation value. This evaluation value becomes the information for auto focusing, and focus ring is controlled by finding the peaks in the evaluation values based on the concepts that:

Picture is in focus → edges of image become clearer → high frequency components of image increase → evaluation value increases



4. Pin function and input/output level (MC68HC05C4FU)

Pin No.	Signal Name	I/O	Functions and I/O Level
1	$\overline{\text{SS}}$ OUT	O	EVR data read timing output (PD5 SS input). V period "L" pulse train.
2	MACRO	O	Indoors/outdoors determination according to aperture value. "H" for indoors and "L" for outdoors.
3			
4			
5			
6	$\overline{\text{LOW CONTRAST}}$	O	Signal to DDS microcomputer (IC561 on VC-60 board). "L" when subject has low contrast.
7	———	–	
8			Not used.
9	———	–	
10	———	–	
11	$\overline{\text{ZOOM T}}$	O	Normally "H". "L" when zoom motor is rotated in telephoto direction by remote commander.
12	$\overline{\text{ZOOM W}}$	O	Normally "H". "L" when zoom motor is rotated in wide angle direction by remote commander.
13	Focus N	O	Normally "L". "H" when focus motor is rotated in far range direction.
14	———	–	
15	Focus F	O	Normally "L". "H" when focus motor is rotated in close range direction.
16	F SPD0	O	0 bit (LSB) of focus motor speed control signal.
17	———	–	
18	F SPD1	O	1 bit of focus motor speed control signal.
19	F SPD2	O	2 bits of focus motor speed control signal.
20	———	–	
21	F SPD3	O	3 bits (MSB) of focus motor speed control signal.
22	———	–	
23	Vss	–	Connected to GND.
24	Vss	–	Connected to GND.
25	———	–	
26	Focus $\overline{\text{NEAR}}$	I	"L" when focus ring is at close range edge.
27	———	–	
28	———	–	
29	———	–	
30	$\overline{\text{FOCUS FAR}}$	I	"L" when focus ring is at far range edge.
31	AF SSW	O	Timing output for bus selection. "H" pulse of V period.
32	———	–	
33	DA STB	O	D/A converter for AF. For data latch. V period "H" pulse train.
34	PAL/$\overline{\text{NTSC}}$	I	PAL/NTSC selection.
35	———	–	
36	$\overline{\text{J}}$ STB	O	External display jig. For data latch. "L" pulse of V period.
37	XCS	O	Active "L" for communication request to IC612 CXD-1204. "L" pulse of V period.
38	TEST	I	Connected to VDD.
39	———	–	
40	MODE	I	Connected to VDD.
41	MISO	I/O	SPI MASTER: in…SLAVE: out…V period "H" pulse train.
42	MOSI	I/O	SPI MASTER: out…SLAVE: in…V period "L" pulse train.
43	$\overline{\text{SCK}}$	I/O	SPI SERIAL CLOCK. V period "L" pulse train.
44	———	–	
45	$\overline{\text{SS}}$	I	V period "L" pulse train.
46	———	–	
47	———	–	
48	$\overline{\text{EVR CS}}$	I	EVR data communication request from DDS microcomputer. "L" pulse of V period.
49	———	–	
50	———	–	
51	$\overline{\text{Focus FG}}$	I	Interrupt generation by Focus motor FG . "L" when auto focus OFF. "H" pulse of period according to Focus motor rotation speed when auto focus ON.
52	CLK OUT	O	Waveform shaped output of Pin (54) clock (1.77 MHz)
53	———	–	
54	CLK IN	I	External clock input. 17.7 MHz clock input to Pin ㉘ of IC612 is divided by 10.
55	VDD		CAM 5V
56	———	–	
57	———	–	
58	———	–	
59	———	–	
60	$\overline{\text{SYS RST}}$	I	Normally "H". "L" when resetting.
61	AREA	I	Interrupt generation by rom CXD-1204 (IC612). V period pulse
62	VPP		CAM 5V
63	WND W/$\overline{\text{N}}$	I	Auto focus ranging area switching. Connected to VDD by 100 kΩ (Fixed to WIDE).
64	———	–	

3-12. INTERFACE

3-12-1. System Control — Video Audio Block Interface

Signal Name	I/O	Pin No.	VTR Mode													CAMERA Mode					
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB• PAUSE	FRAME	SLOW	REC *13	REC *13	STAND BY	REC	EDIT SEARCH		REC REVIEW	
						CUE	REVIEW		CUE	REVIEW								FWD	RVS	FWD	RVS
SP/$\overline{\text{LP}}$	O	Pin ⑭ of IC205 on VS-37 board	H	H	H	*2	*2	*2	*2	*2	*1	*1	*1	*14	H	*15	*14	*2	*2	*2	*2
VA PB MODE	O	Pin ⑬ of IC205 on VS-37 board	L	L	L	H	H	H	H	H	H	H	H	L	L	L	L	H	H	H	H
AUDIO MUTE	O	Pin ⑫ of IC205 on VS-37 board	L	L	L	H	H	L^{*3}	H	H	H	H	H	L	L	L	L	H	H	L	H
VIDEO MUTE	O	Pin ⑪ of IC205 on VS-37 board	L	L	L	L	L	L^{*3}	L	L	L	L	L	L	L	L	L	L	h	L	L
CAM/$\overline{\text{LINE}}$	O	Pin ⑦ of IC205 on VS-37 board	L	L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	H	H	H
JOG/DEW LED	O	Pin ⑥ of IC205 on VS-37 board	L^{*4}	L	L	H	H	L	H	H	H	H	H	L	L	L	L	L	H	L	H
$\overline{\text{REC LED}}$	O	Pin ⑤ of IC205 on VS-37 board	H	H	H	H	H	H	H	H	H	H	H	L	L	H	H	H	H	H	H
POWER SAVE	O	Pin ④ of IC205 on VS-37 board	H	H	H	L	L	L	L	L	L	L	L	L	H	H	L	L	L	L	L
JOG VD	O	Pin (76) of IC601 on VS-37 board	L	L	L	*5	*5	H	*5	*5	*5	*5	*5	L	L	L	L	L	*5	L	*5
RP PB MODE	O	Pin (77) of IC601 on VS-37 board	H	H	H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
$\overline{\text{FE ON}}$	O	Pin (78) of IC601 on VS-37 board	H	H	H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
$\overline{\text{1/2 RF SWP}}$	O	Pin (79) of IC601 on VS-37 board	H/L	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
RF SWP	O	Pin (80) of IC601 on VS-37 board	H/L	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
PB 2B MUTE	O	Pin ③ of IC601 on VS-37 board	H/L	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8	L	L	L	L	*8	*8	*8	*8
PB 1B MUTE	O	Pin ④ of IC601 on VS-37 board																			
PB 2A MUTE	O	Pin ⑤ of IC601 on VS-37 board																			
PB 1A MUTE	O	Pin ⑥ of IC601 on VS-37 board																			

Signal Name	I/O	Pin No.	VTR Mode													CAMERA Mode					
			STOP	FF	REW	FR SEARCH		PB	PICTURE SERACH		PB• PAUSE	FRAME	SLOW	REC *13	REC PAUSE *13	STAND BY	REC	EDIT SEARCH		REC REVIEW	
						CUE	REVIEW		CUE	REVIEW								FWD	RVS	FWD	RVS
REC2B	O	Pin ⑦ of IC601 on VS-37 board	H/L	H	H	H	H	H	H	H	H	H	H	*9	H	H	*9	H	H	H	H
REC1B	O	Pin ⑧ of IC601 on VS-37 board																			
REC2A	O	Pin ⑨ of IC601 on VS-37 board																			
REC1A	O	Pin ⑩ of IC601 on VS-37 board																			
$\overline{\text{VIDEO CS}}$	O	Pin ⑮ of IC601 on VS-37 board	"L" pulse of V period.																		
$\overline{\text{AUDIO STB}}$	O	Pin ⑯ of IC601 on VS-37 board																			
COSMO SO	O	Pin ㊳ of IC601 on VS-37 board	V period pulse train.																		
$\overline{\text{COSMO SCK}}$	I/O	Pin ㊴ of IC601 on VS-37 board																			
CUE/REV SP/$\overline{\text{LP}}$	I	Pin (59) of IC601 on VS-37 board	H	*10	*10	*10	*10	L	*10	*10	*10			H	H/L	H/L	H	L	*10	L	*10
CLOG	I	Pin (57) of IC601 on VS-37 board	H	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	H	*11	*11	H	*11	*11	*11	*11
COMPOSITE SYNC	I	Pin (58) of IC601 on VS-37 board	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12

*1. Outputs the determination result of last mode. SP mode "H", LP mode "L".

*2. Outputs the determination result of recording mode of playback tape. SP mode "H", LP mode "L".

*3. "H" at non signal portion of tape

*4. "H" after mode shift completion during dew condensation generation.

*5. Simulated VD signal

*6. 12.5 Hz duty 50% pulse (synchronized to drum rotation)

*7. 25 Hz duty 50% pulse (synchronized to drum rotation)

*8. See timing chart 6.

*9. See timing chart 7.

*10. "H" at SP recording portion of tape, "L" at LP recording portion.

*11. "H" at no recording portion of tape, or drop-out portion. Head clog detection input.

*12. Composite sync signal input (polarity=+) separated from line input video signal, camera video signal, or playback video signal.

*13. Effectively for the model installed REC switch.

*14. According to the LP/SP switch position. "H" when the SP position. "L" when the LP position.

*15. According to the LP/SP switch position. "H" when the SP position. "L/H" when the LP position.

3-12-2. System Control — Servo Block Interface

Signal Name	I/O	Pin No.	VTR Mode													CAMERA Mode					
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB• PAUSE	FRAME	SLOW	REC *19	REC PAUSE *19	STAND BY	REC	EDIT SEARCH		REC REVIEW	
						CUE	REVIEW		CUE	REVIEW								FWD	RVS	FWD	RVS
T.REEL FG	I	Pin ㊾ of IC601 on VS-37 board	–	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	–	–	*1	*1	*1	*1	*1
S.REEL FG	I	Pin ㊿ of IC601 on VS-37 board	–	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	–	–	*1	*1	*1	*1	*1
ATF ERROR	I	Pin (51) of IC601 on VS-37 board	–	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
DRUM PG	I	Pins (55) and (60) of IC601 on VS-37 board	–	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3
DRUM FG	I	Pin (61) of IC601 on VS-37 board	–	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
CAP FG	I	Pins (62) and (69) of IC601 on VS-37 board	–	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5
CAP ON	O	Pin ⑱ of IC601 on VS-37 board	L	H	H	H	H	H	H	H	L	*15	*15	H	L	L	H	H	H	H	H
SEL 2	O	Pin ① of IC601 on VS-37 board	H	*6	*6	*7	*7	*8	*7	*7	L	*9	*10	*6	H	H	*6	*8	*11	*8	*11
SEL 1	O	Pin ② of IC601 on VS-37 board	L	*6	*6	*7	*7	*8	*7	*7	L	*9	*10	*6	L	L	*6	*8	*11	*8	*11
DRUM STEP *12	O	Pin (63) of IC601 on VS-37 board	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
DRUM $\overline{\text{FWD}}$/ RVS *13	O	Pin (64) of IC601 on VS-37 board	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
CAP ERH *14	O	Pin (65) of IC601 on VS-37 board	–	HIZ	HIZ	HIZ	HIZ	HIZ	HIZ	HIZ	HIZ	*15	*15	HIZ	HIZ	HIZ	HIZ	HIZ	HIZ	HIZ	HIZ
DRUM D/A	O	Pin (66) of IC601 on VS-37 board	–	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16
CAP PWM	O	Pin (67) of IC601 on VS-37 board	–	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17
LIM CONT *18	O	Pin (68) of IC601 on VS-37 board	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
DRUM ON	O	Pin (75) of IC601 on VS-37 board	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H

*1. Pulse is input by reel rotation.

*2. ATF error voltage input.

*3. 1 PG pulse is input with 1 rotation of drum. Approx. 37.5 Hz.

*4. 6 FG pulses are input with 1 rotation of drum. Approx. 225 Hz.

*5. 360 FG pulses are input with 1 rotation of capstan. Approx. 1145.5 Hz during REC/PB (SP).

*6. See timing chart 1.

*7. See timing chart 2.

*8. See timing chart 3.

*9. See timing chart 5.

*10. See timing chart 5.

*11. See timing chart 4.

*12. Normally "L", "H" only when drum motor starts.

*13. Normally "L". "H" temporarily only when loading/unloading (Drum inverts.)

*14. Normally HIZ (High impedance). "H" during start and stop of capstan

*15. "H" pulse when tape is advanced.

*16. "H" pulse/"L" pulse output as center level HIZ (2.5 Vdc).

*17. 64 μsec sync PWM signal

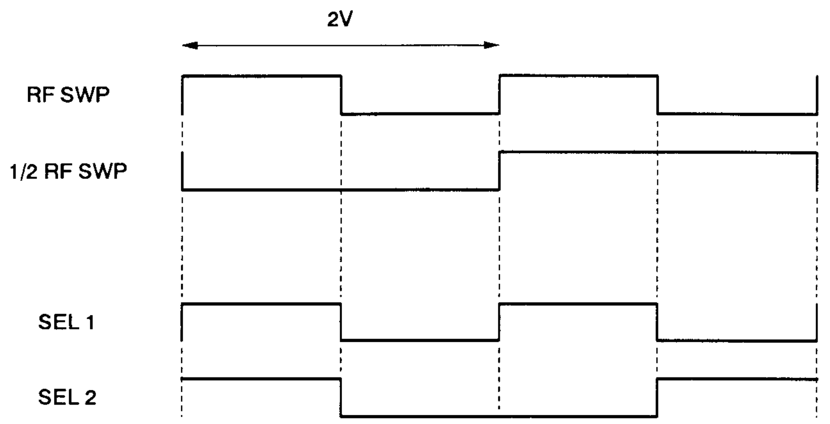
*18. "H" when cassette loading.

*19. Effectively for the model installed REC switch.

3-12-3. Timing Chart

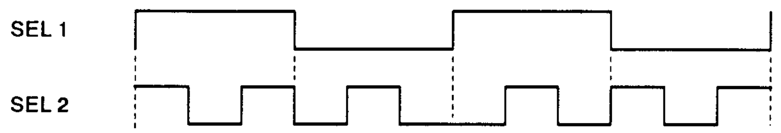
Timing chart 1

FF, REW, REC


2V
RF SWP
1/2 RF SWP
SEL 1
SEL 2

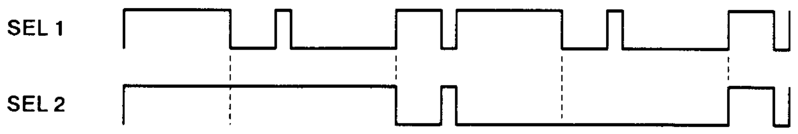
Timing chart 2

FR-SEARCH(CUE/REV)
PICTURE-SEARCH(CUE/REV)



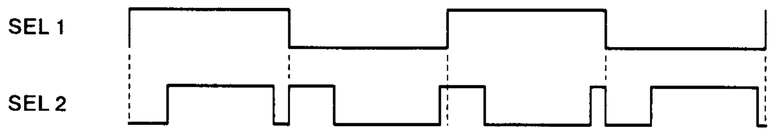
Timing chart 3

PB, EDIT-SEARCH(FWD)
REC-REVIEW(FWD)



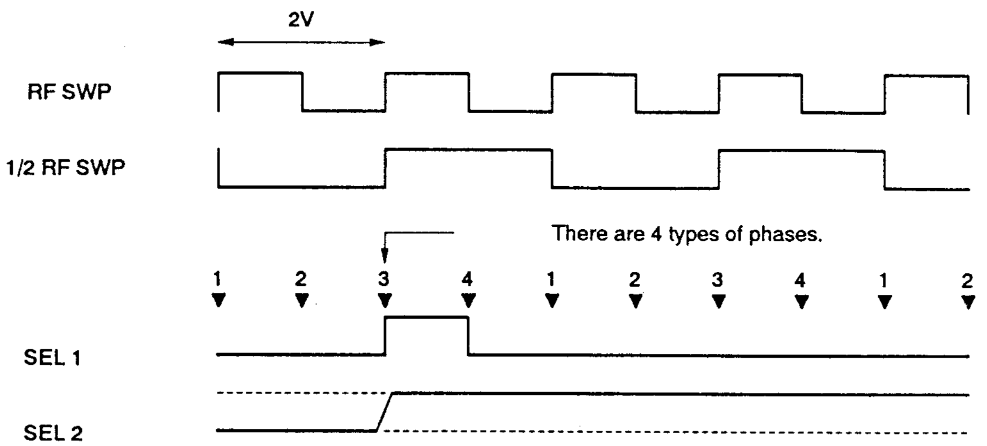
Timing chart 4

EDIT-SEARCH(RVS)
REC-REVIEW(RVS)



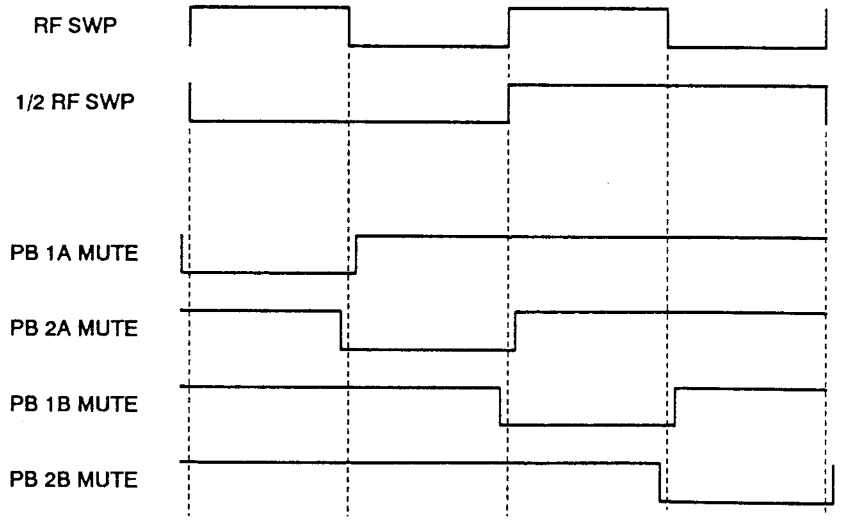
Timing chart 5

FRAME, SLOW

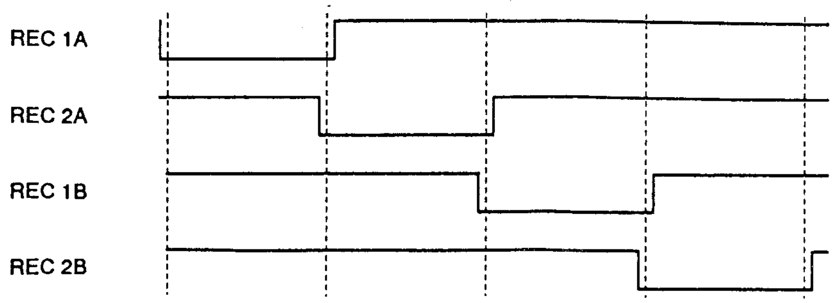

2V
RF SWP
1/2 RF SWP
There are 4 types of phases.
1
2
3
4
1
2
3
4
1
2
SEL 1
SEL 2

- 1 pulse generates every frame advancing is pressed in FRAME.
- 1 pulse generates 1 time in 10V in SLOW.

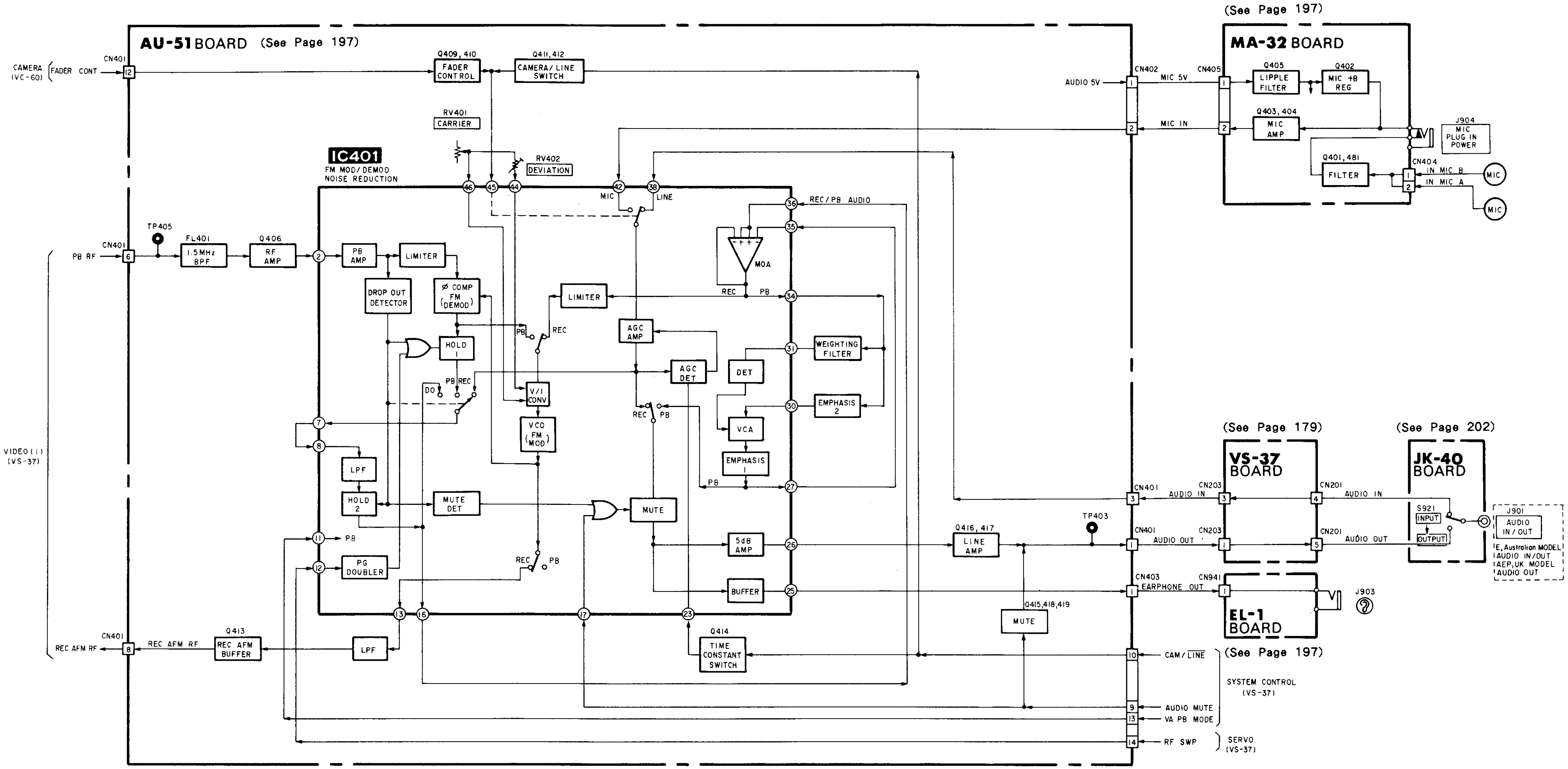
Timing chart 6


RF SWP
1/2 RF SWP
PB 1A MUTE
PB 2A MUTE
PB 1B MUTE
PB 2B MUTE

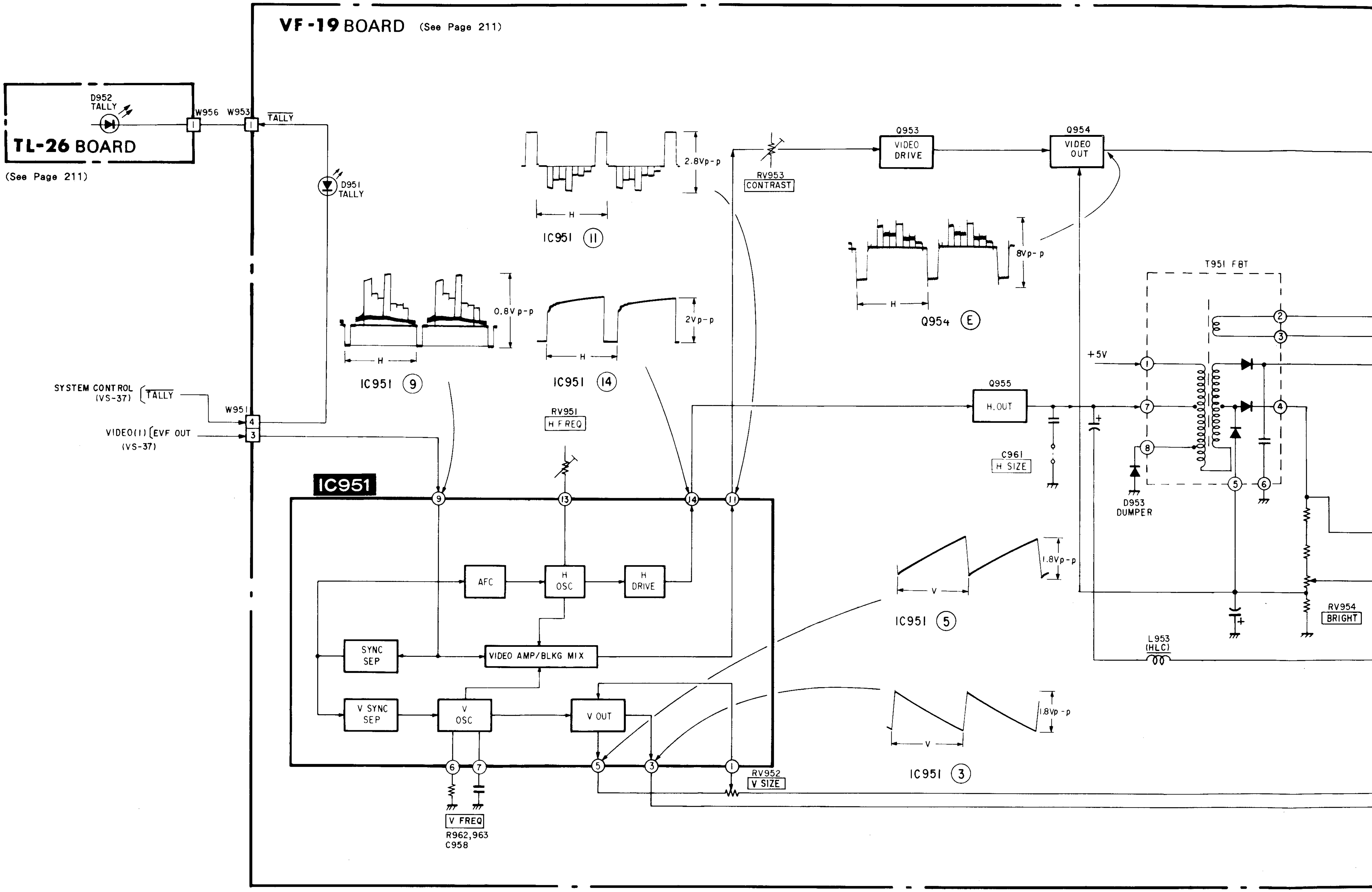
Timing chart 7


REC 1A
REC 2A
REC 1B
REC 2B

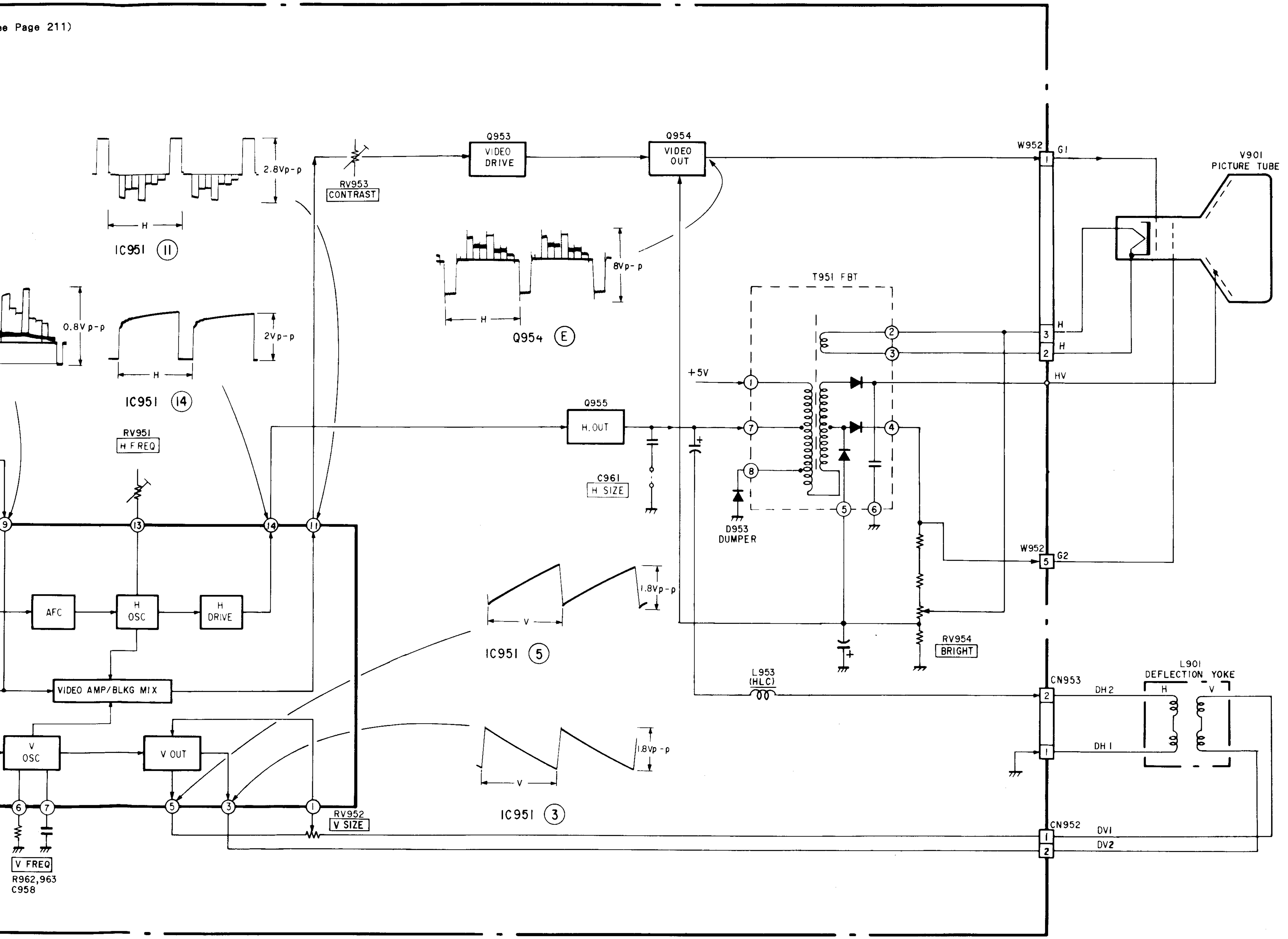
3-13. AUDIO BLOCK DIAGRAM


AU-51 BOARD (See Page 197)
CAMERA (VC-60)
FADER CONT
CN401
PB RF
VIDEO (1) (VS-37)
REC AFM RF
TP405
FL401
1.5MHz BPF
Q406
RF AMP
Q409, 410
FADER CONTROL
Q411, 412
CAMERA/LINE SWITCH
RV401
CARRIER
RV402
DEVIATION
IC401
FM MOD/DEMOD NOISE REDUCTION
PB AMP
LIMITER
DROP OUT DETECTOR
ø COMP FM (DEMOD)
HOLD 1
DO
PB
REC
V/I CONV
VCO FM (MOD)
LPF
HOLD 2
MUTE DET
PG DOUBLER
MIC
LINE
REC/PB AUDIO
MOA
AGC AMP
AGC DET
DET
VCA
EMPHASIS 1
WEIGHTING FILTER
EMPHASIS 2
MUTE
5dB AMP
BUFFER
Q413
REC AFM BUFFER
Q414
TIME CONSTANT SWITCH
Q416, 417
LINE AMP
TP403
Q415, 418, 419
MUTE
AUDIO 5V
CN402
MIC 5V
MIC IN
CN401
AUDIO IN
AUDIO OUT
CN403
EARPHONE OUT
CAM/LINE
AUDIO MUTE
VA PB MODE
RF SWP
SYSTEM CONTROL (VS-37)
SERVO (VS-37)
(See Page 197)
MA-32 BOARD
CN405
Q405
LIPPLE FILTER
Q402
MIC +B REG
Q403, 404
MIC AMP
Q401, 481
FILTER
CN404
IN MIC B
IN MIC A
MIC
J904
MIC PLUG IN POWER
(See Page 179)
VS-37 BOARD
CN203
CN201
(See Page 202)
JK-40 BOARD
S921
INPUT
OUTPUT
J901
AUDIO IN/OUT
E, Australian MODEL AUDIO IN/OUT
AEP, UK MODEL AUDIO OUT
CN941
EL-1 BOARD
J903
(See Page 197)

3-14. VIEW FINDER BLOCK DIAGRAM

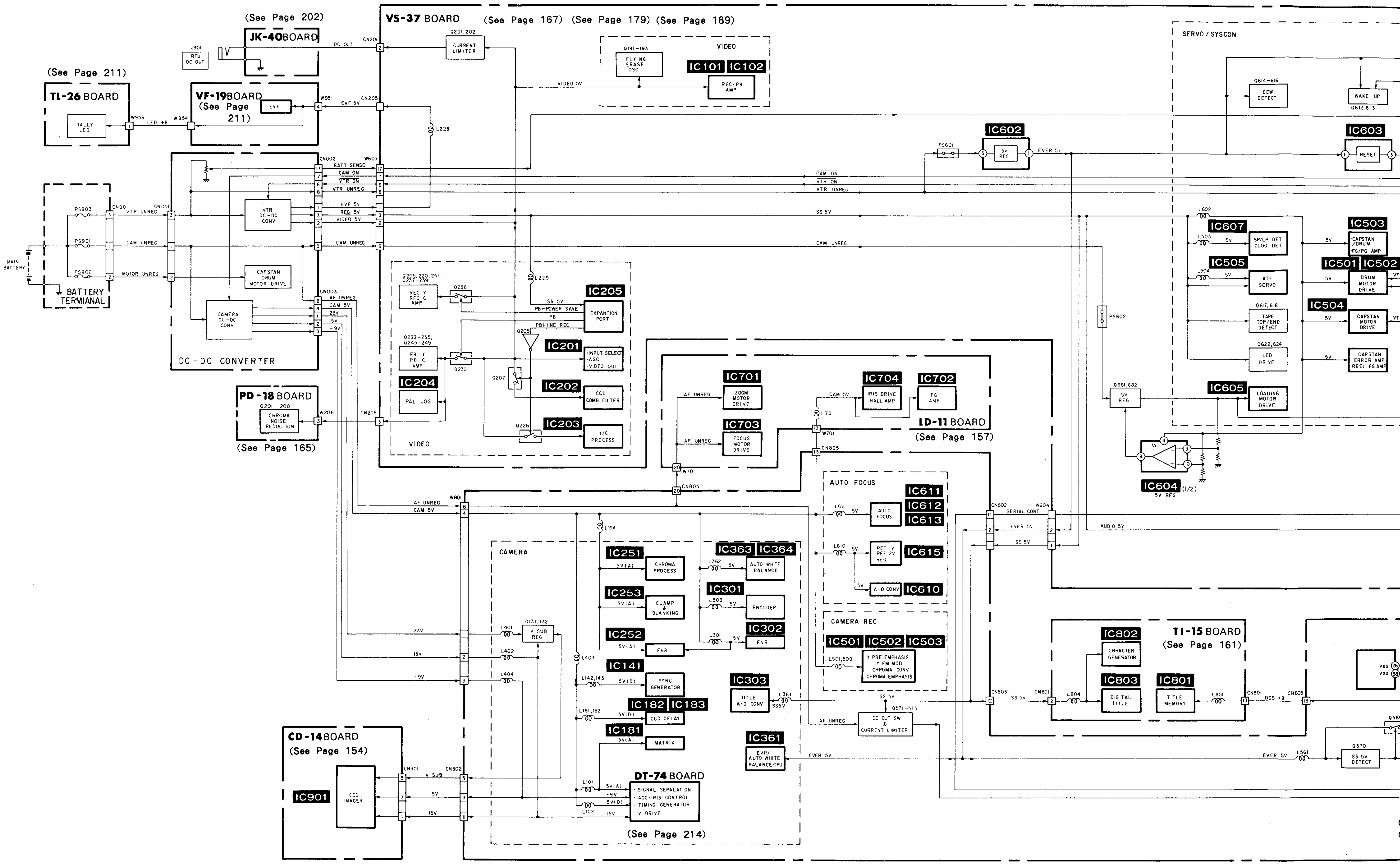

VF-19 BOARD (See Page 211)
TL-26 BOARD
(See Page 211)
D952 TALLY
W956
W953
TALLY
D951 TALLY
SYSTEM CONTROL (VS-37)
TALLY
VIDEO(1) (VS-37)
EVF OUT
W951
4
3
IC951
9
13
14
11
AFC
H OSC
H DRIVE
SYNC SEP
VIDEO AMP/BLKG MIX
V SYNC SEP
V OSC
V OUT
6
7
5
3
1
V FREQ
R962,963
C958
RV952
V SIZE
RV951
H FREQ
IC951 ⑨
0.8Vp-p
H
IC951 ⑪
2.8Vp-p
IC951 ⑭
2Vp-p
RV953
CONTRAST
Q953
VIDEO DRIVE
Q954
VIDEO OUT
Q954 Ⓔ
8Vp-p
T951 FBT
+5V
Q955
H.OUT
C961
H SIZE
D953
DUMPER
L953
(HLC)
RV954
BRIGHT
IC951 ⑤
1.8Vp-p
V
IC951 ③
1.8Vp-p
①
②
③
④
⑤
⑥
⑦
⑧

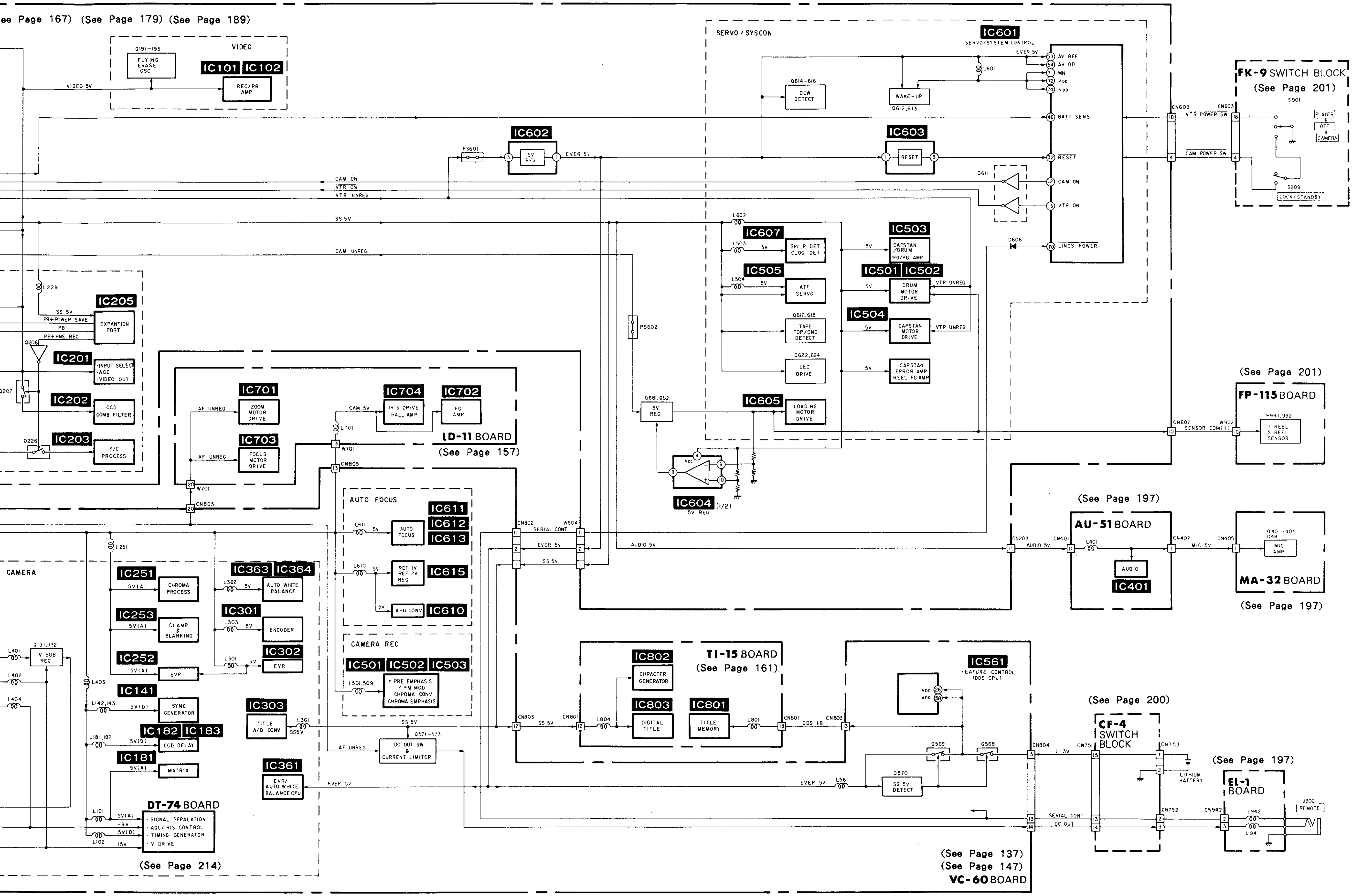
e Page 211)



2.8Vp-p
H
IC951 ⑪
0.8Vp-p
2Vp-p
H
IC951 ⑭
RV951
H FREQ
RV953
CONTRAST
Q953
VIDEO DRIVE
Q954
VIDEO OUT
8Vp-p
H
Q954 Ⓔ
T951 FBT
+5V
Q955
H.OUT
C961
H SIZE
D953
DUMPER
RV954
BRIGHT
W952
G1
V901
PICTURE TUBE
H
H
HV
W952
G2
1.8Vp-p
V
IC951 ⑤
AFC
H OSC
H DRIVE
VIDEO AMP/BLKG MIX
V OSC
V OUT
1.8Vp-p
V
IC951 ③
RV952
V SIZE
V FREQ
R962,963
C958
L953
(HLC)
CN953
DH2
DH1
L901
DEFLECTION YOKE
H
V
CN952
DV1
DV2

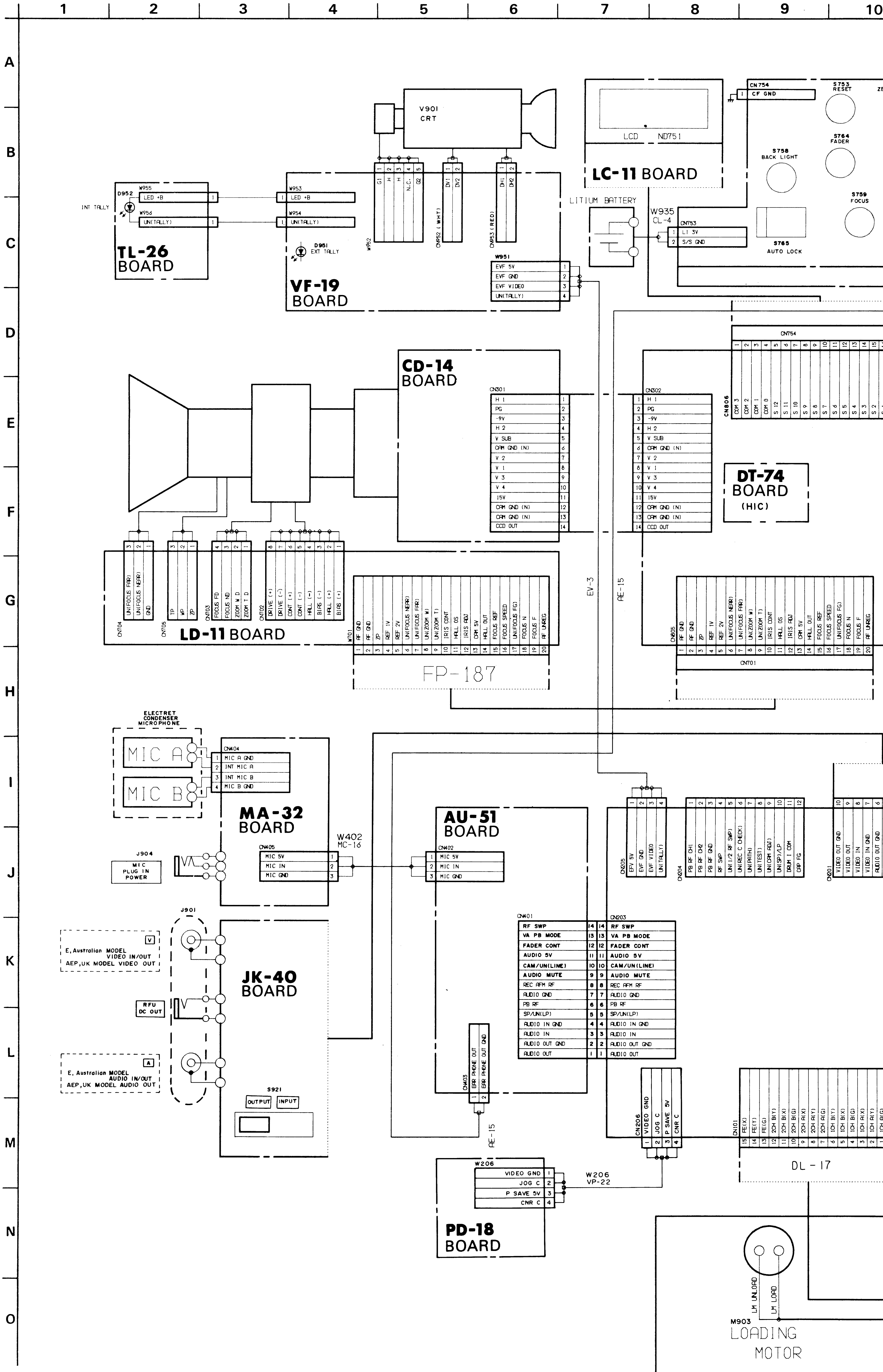
3-15. POWER BLOCK DIAGRAM


(See Page 202)
JK-40 BOARD
J901
RFU DC OUT
DC OUT
CN201
(See Page 211)
TL-26 BOARD
TALLY LED
W956
LED +B
W954
VF-19 BOARD
(See Page 211)
EVF
W951
EVF 5V
CN205
L228
VS-37 BOARD
(See Page 167) (See Page 179) (See Page 189)
Q201, 202
CURRENT LIMITER
VIDEO 5V
Q191-193
FLYING ERASE OSC
VIDEO
IC101 IC102
REC/PB AMP
PS903
PS901
PS902
MAIN BATTERY
BATTERY TERMIANAL
CN901
VTR UNREG
CAM UNREG
MOTOR UNREG
CN001
VTR DC-DC CONV
CAPSTAN DRUM MOTOR DRIVE
CAMERA DC-DC CONV
CN002
W605
BATT SENSE
CAM ON
VTR ON
VTR UNREG
EVF 5V
REG 5V
VIDEO 5V
CAM UNREG
CN003
AF UNREG
CAM 5V
23V
15V
-9V
DC-DC CONVERTER
PD-18 BOARD
Q201-208
CHROMA NOISE REDUCTION
W206
CN206
(See Page 165)
Q205, 220, 241, Q237-239
REC Y REC C AMP
Q236
Q233-235, Q245-249
PB Y PB C AMP
Q232
IC204
PAL JOG
L229
SS 5V
PB+POWER SAVE
PB
PB+HNE REC
IC205
EXPANTION PORT
Q206
IC201
·INPUT SELECT ·AGC ·VIDEO OUT
Q207
IC202
CCD COMB FILTER
Q226
IC203
Y/C PROCESS
VIDEO
IC701
ZOOM MOTOR DRIVE
AF UNREG
IC703
FOCUS MOTOR DRIVE
IC704
IRIS DRIVE HALL AMP
IC702
FG AMP
CAM 5V
L701
LD-11 BOARD
(See Page 157)
W701
CN805
PS601
IC602
5V REG
EVER 5V
CAM ON
VTR ON
VTR UNREG
SS 5V
CAM UNREG
PS602
SERVO / SYSCON
Q614-616
DEW DETECT
WAKE-UP
Q612, 613
IC603
RESET
L602
L503
IC607
SP/LP DET CLOG DET
IC503
CAPSTAN /DRUM FG/PG AMP
IC505
L504
ATF SERVO
IC501 IC502
DRUM MOTOR DRIVE
Q617, 618
TAPE TOP/END DETECT
IC504
CAPSTAN MOTOR DRIVE
Q622, 624
LED DRIVE
CAPSTAN ERROR AMP REEL FG AMP
Q661, 682
5V REG
IC605
LOADING MOTOR DRIVE
Vcc
IC604 (1/2)
5V REG
W801
AF UNREG
CAM 5V
L251
CAMERA
IC251
5V(A)
CHROMA PROCESS
IC253
CLAMP & BLANKING
IC252
EVR
IC141
SYNC GENERATOR
5V(D)
L142, 143
L181, 182
IC182 IC183
CCD DELAY
IC181
MATRIX
IC363 IC364
L362
AUTO WHITE BALANCE
IC301
L303
ENCODER
L301
IC302
EVR
IC303
TITLE A/D CONV
L361
IC361
EVR/ AUTO WHITE BALANCE CPU
Q131, 132
V SUB REG
L401
L402
L404
L403
23V
15V
-9V
CD-14 BOARD
(See Page 154)
IC901
CCD IMAGER
CN301
CN302
V SUB
L101
L102
DT-74 BOARD
·SIGNAL SEPALATION ·AGC/IRIS CONTROL ·TIMING GENERATOR ·V DRIVE
(See Page 214)
AUTO FOCUS
IC611
IC612
IC613
L611
AUTO FOCUS
L610
REF 1V REF 2V REG
IC615
A-D CONV
IC610
CAMERA REC
IC501 IC502 IC503
L501, 509
Y PRE EMPHASIS Y FM MOD CHROMA CONV CHROMA EMPHASIS
SS 5V
Q571-573
DC OUT SW & CURRENT LIMITER
AF UNREG
EVER 5V
CN802
W604
SERIAL CONT
AUDIO 5V
CN803
CN801
L804
TI-15 BOARD
(See Page 161)
IC802
CHRACTER GENERATOR
IC803
DIGITAL TITLE
IC801
TITLE MEMORY
L801
DDS +B
L561
Q570
SS 5V DETECT
VDD


(See Page 167)
(See Page 179)
(See Page 189)
VIDEO
Q191–193
FLYING ERASE OSC
IC101
IC102
REC/PB AMP
VIDEO 5V
SERVO / SYSCON
IC601
SERVO/SYSTEM CONTROL
EVER 5V
AV REF
AV DD
MNI
VDD
VPP
BATT SENS
RESET
CAM ON
VTR ON
LINCS POWER
L601
Q614–616
DEW DETECT
WAKE-UP
Q612,613
IC602
5V REG
PS601
EVER 5V
IC603
RESET
Q611
D606
CAM ON
VTR ON
VTR UNREG
SS 5V
CAM UNREG
L602
IC607
L503
SP/LP DET CLOG DET
IC503
CAPSTAN /DRUM FG/PG AMP
IC505
L504
ATF SERVO
IC501
IC502
DRUM MOTOR DRIVE
VTR UNREG
Q617,618
TAPE TOP/END DETECT
IC504
CAPSTAN MOTOR DRIVE
Q622,624
LED DRIVE
CAPSTAN ERROR AMP REEL FG AMP
IC605
LOADING MOTOR DRIVE
PS602
Q681,682
5V REG
IC604 (1/2)
5V REG
Vcc
FK-9 SWITCH BLOCK
(See Page 201)
S901
PLAYER
OFF
CAMERA
S909
LOCK/STANDBY
CN603
VTR POWER SW
CAM POWER SW
(See Page 201)
FP-115 BOARD
CN602
W902
SENSOR COM(+)
H991,992
T REEL S REEL SENSOR
L229
IC205
SS 5V
PB+POWER SAVE
PB
PB+HNE REC
EXPANTION PORT
Q206
IC201
INPUT SELECT AGC VIDEO OUT
Q207
IC202
CCD COMB FILTER
Q226
IC203
Y/C PROCESS
IC701
ZOOM MOTOR DRIVE
AF UNREG
IC704
IRIS DRIVE HALL AMP
CAM 5V
IC702
FG AMP
L701
IC703
FOCUS MOTOR DRIVE
LD-11 BOARD
(See Page 157)
W701
CN805
AUTO FOCUS
IC611
IC612
IC613
L611
AUTO FOCUS
L610
REF 1V REF 2V REG
IC615
A-D CONV
IC610
CAMERA REC
IC501
IC502
IC503
L501,509
Y PRE EMPHASIS Y FM MOD CHROMA CONV CHROMA EMPHASIS
CN802
W604
SERIAL CONT
EVER 5V
SS 5V
AUDIO 5V
(See Page 197)
AU-51 BOARD
CN203
CN401
L401
AUDIO
IC401
CN402
MIC 5V
CN405
Q401–405, Q481
MIC AMP
MA-32 BOARD
(See Page 197)
CAMERA
L251
IC251
CHROMA PROCESS
IC253
CLAMP & BLANKING
IC252
EVR
IC141
SYNC GENERATOR
IC182
IC183
CCD DELAY
IC181
MATRIX
IC363
IC364
L362
AUTO WHITE BALANCE
IC301
L303
ENCODER
IC302
L301
EVR
IC303
TITLE A/D CONV
L361
SS5V
IC361
EVR/ AUTO WHITE BALANCE CPU
Q131,132
V SUB REG
L401
L402
L404
L403
L142,143
L181,182
L101
L102
DT-74 BOARD
SIGNAL SEPALATION
AGC/IRIS CONTROL
TIMING GENERATOR
V DRIVE
(See Page 214)
5V(A)
5V(D)
-9V
15V
SS 5V
Q571–573
DC OUT SW & CURRENT LIMITER
AF UNREG
EVER 5V
IC802
CHRACTER GENERATOR
TI-15 BOARD
(See Page 161)
IC803
DIGITAL TITLE
IC801
TITLE MEMORY
CN803
CN801
L804
L801
DDS +B
IC561
FEATURE CONTROL (DDS CPU)
VDD
Q569
Q568
Q570
SS 5V DETECT
L561
CN804
L1 3V
SERIAL CONT
DC OUT
(See Page 200)
CF-4 SWITCH BLOCK
CN751
CN753
LITHIUM BATTERY
CN752
(See Page 197)
EL-1 BOARD
CN942
L942
L941
J902
REMOTE
(See Page 137)
(See Page 147)
VC-60 BOARD

PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM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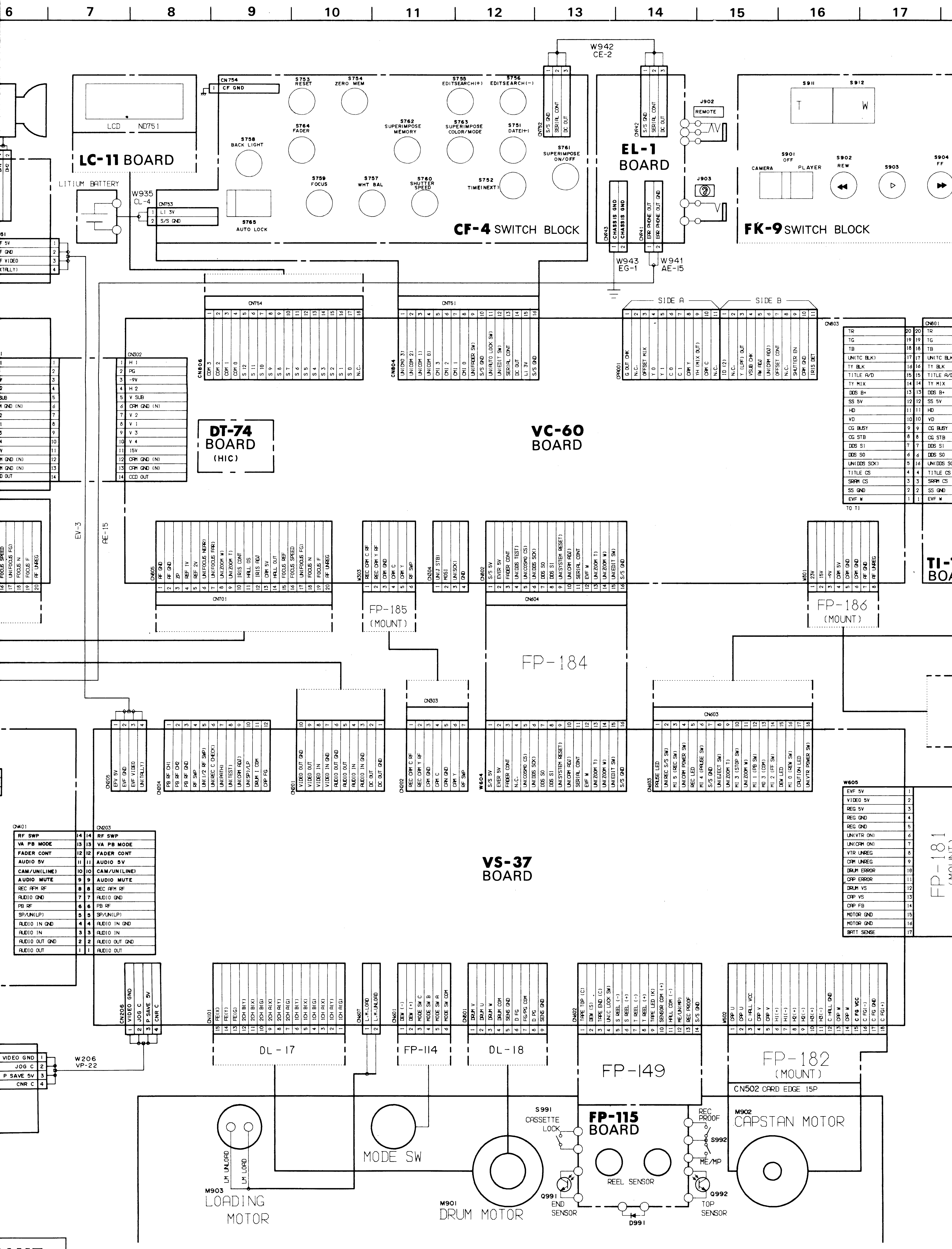
8
9
10
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
V901
CRT
LCD ND751
LC-11 BOARD
CN754
CF GND
S753 RESET
S764 FADER
S758 BACK LIGHT
S759 FOCUS
S765 AUTO LOCK
LITIUM BATTERY
W935 CL-4
CN753
LI 3V
S/S GND
INT TALLY
D952
W955
LED +B
W956
UN(TALLY)
TL-26 BOARD
W953
W954
D951 EXT TALLY
VF-19 BOARD
W952
CN952 (WHT)
CN953 (RED)
G1
H
H
N.C.
G2
DV1
DV2
DH1
DH2
W951
EVF 5V
EVF GND
EVF VIDEO
UN(TALLY)
CD-14 BOARD
CN301
CN302
H 1
PG
-9V
H 2
V SUB
CAM GND (N)
V 2
V 1
V 3
V 4
15V
CCD OUT
DT-74 BOARD (HIC)
CN806
CN754
COM 3
COM 2
COM 1
COM 0
S 12
S 11
S 10
S 9
S 8
S 7
S 6
S 5
S 4
S 3
S 2
CN704
UN(FOCUS FAR)
UN(FOCUS NEAR)
GND
CN705
TP
WP
ZP
CN703
FOCUS FD
FOCUS ND
ZOOM W D
ZOOM T D
CN702
DRIVE (+)
DRIVE (-)
CONT (+)
CONT (-)
HALL (-)
BIAS (-)
HALL (+)
BIAS (+)
LD-11 BOARD
W701
AF GND
AF GND
ZP
REF 1V
REF 2V
UN(FOCUS NEAR)
UN(FOCUS FAR)
UN(ZOOM W)
UN(ZOOM T)
IRIS CONT
HALL OS
IRIS ADJ
CAM 5V
HALL OUT
FOCUS REF
FOCUS SPEED
UN(FOCUS FG)
FOCUS N
FOCUS F
AF UNREG
FP-187
EV-3
AE-15
CN805
CN701
ELECTRET CONDENSER MICROPHONE
MIC A
MIC B
CN404
MIC A GND
INT MIC A
INT MIC B
MIC B GND
MA-32 BOARD
J904
MIC PLUG IN POWER
CN405
MIC 5V
MIC IN
MIC GND
W402 MC-16
AU-51 BOARD
CN402
CN205
EVF 5V
EVF GND
EVF VIDEO
UN(TALLY)
CN204
PB RF CH1
PB RF CH2
PB RF GND
RF SWP
UN(1/2 RF SWP)
UN(REC C CHECK)
UN(PATH)
UN(TEST)
UN(CAM ADJ)
UN(SP/LP)
DRUM 1 COM
CAP FG
CN201
VIDEO OUT GND
VIDEO OUT
VIDEO IN
VIDEO IN GND
AUDIO OUT GND
J901
V
E,Australian MODEL VIDEO IN/OUT
AEP,UK MODEL VIDEO OUT
JK-40 BOARD
RFU DC OUT
A
E, Australian MODEL AUDIO IN/OUT
AEP,UK MODEL AUDIO OUT
S921
OUTPUT
INPUT
CN401
CN203
RF SWP
VA PB MODE
FADER CONT
AUDIO 5V
CAM/UN(LINE)
AUDIO MUTE
REC AFM RF
AUDIO GND
PB RF
SP/UN(LP)
AUDIO IN GND
AUDIO IN
AUDIO OUT GND
AUDIO OUT
CN403
EAR PHONE OUT
EAR PHONE OUT GND
AE-15
CN206
VIDEO GND
JOG C
P SAVE 5V
CNR C
CN101
FE(X)
FE(Y)
FE(G)
2CH B(Y)
2CH B(X)
2CH B(G)
2CH A(X)
2CH A(G)
1CH B(Y)
1CH B(X)
1CH B(G)
1CH A(X)
1CH A(Y)
1CH A(G)
DL-17
W206
VIDEO GND
JOG C
P SAVE 5V
CNR C
W206 VP-22
PD-18 BOARD
LM UNLOAD
LM LOAD
M903
LOADING MOTOR

FRAME FRAME


6
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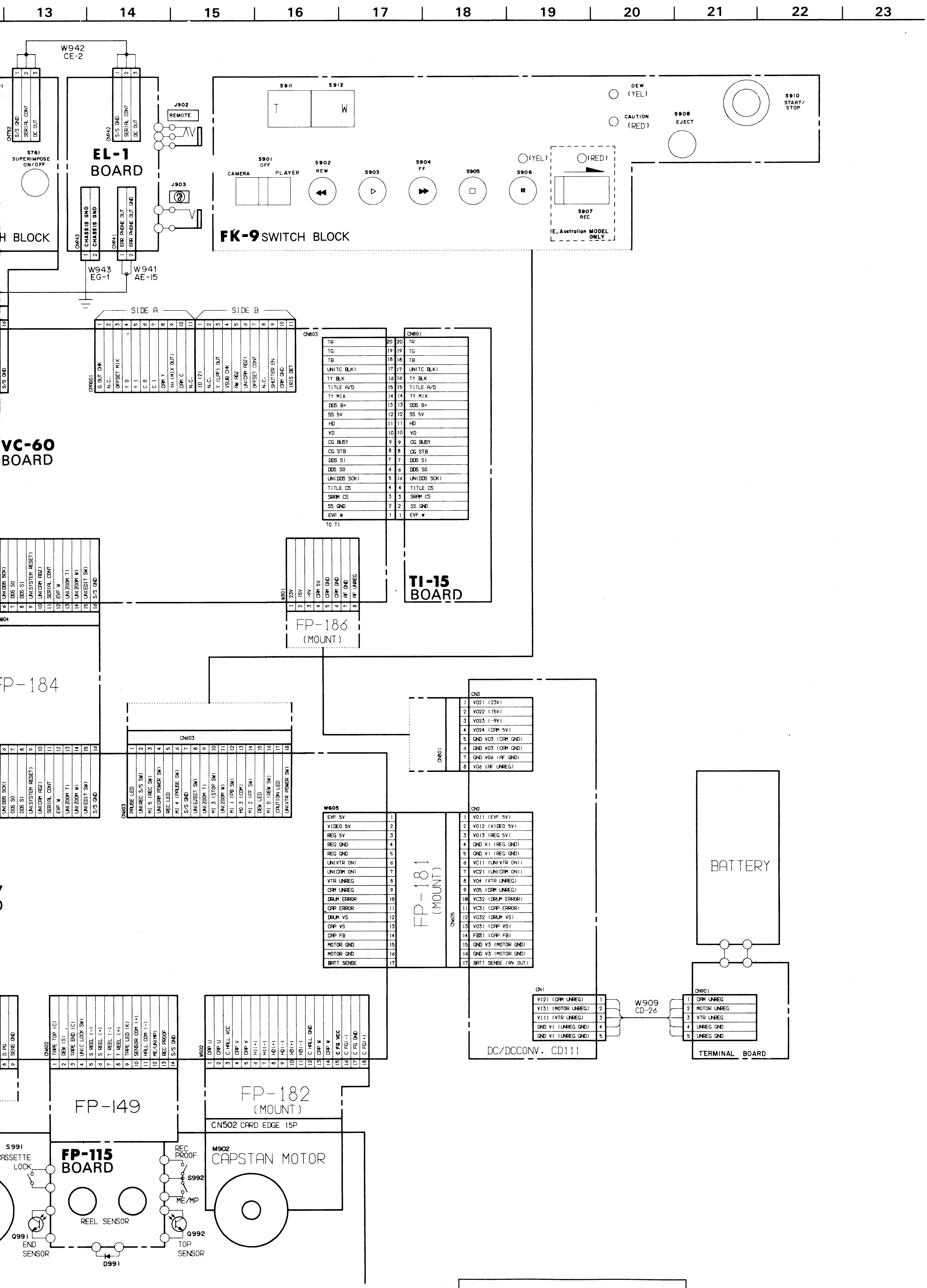
16
17
LCD ND751
LC-11 BOARD
LITIUM BATTERY
W935 CL-4
CN754
CF GND
CN753
LI 3V
S/S GND
S753 RESET
S754 ZERO MEM
S755 EDITSEARCH(+)
S756 EDITSEARCH(-)
S764 FADER
S762 SUPERIMPOSE MEMORY
S763 SUPERIMPOSE COLOR/MODE
S751 DATE(+)
S758 BACK LIGHT
S761 SUPERIMPOSE ON/OFF
S759 FOCUS
S757 WHT BAL
S760 SHUTTER SPEED
S752 TIME(NEXT)
S765 AUTO LOCK
CF-4 SWITCH BLOCK
CN752
S/S GND
SERIAL CONT
DC OUT
W942 CE-2
CN942
EL-1 BOARD
J902 REMOTE
J903
CN943
CHASSIS GND
CN941
EAR PHONE OUT
EAR PHONE OUT GND
W943 EG-1
W941 AE-15
S911
S912
T
W
S901 OFF
CAMERA
PLAYER
S902 REW
S903
S904 FF
FK-9 SWITCH BLOCK
CN754
CN751
CN806
CN804
CN803
SIDE A
SIDE B
CN801
TO T1
CN302
DT-74 BOARD (HIC)
VC-60 BOARD
EV-3
AE-15
CN805
CN701
W303
CN304
CN602
CN604
W801
FP-185 (MOUNT)
FP-184
FP-186 (MOUNT)
TI-
BOA
CN303
CN603
CN205
CN204
CN201
CN202
W604
CN403
W605
CN401
CN203
VS-37 BOARD
FP-181 (MOUNT)
CN206
CN101
CN607
CN601
CN501
CN602
W502
W206 VP-22
DL-17
FP-114
DL-18
FP-149
FP-182 (MOUNT)
CN502 CARD EDGE 15P
M903
LOADING MOTOR
LM UNLOAD
LM LOAD
MODE SW
M901
DRUM MOTOR
S991 CASSETTE LOCK
FP-115 BOARD
REEL SENSOR
Q991 END SENSOR
D991
REC PROOF
S992
ME/MP
Q992 TOP SENSOR
M902 CAPSTAN MOTOR


13
14
15
16
17
18
19
20
21
22
23
W942
CE-2
CN762
S/S GND
SERIAL CONT
DC OUT
S761
SUPERIMPOSE
ON/OFF
H BLOCK
CN942
S/S GND
SERIAL CONT
DC OUT
EL-1
BOARD
J902
REMOTE
J903
CN943
CHASSIS GND
CHASSIS GND
CN941
EAR PHONE OUT
EAR PHONE OUT GND
W943
EG-1
W941
AE-15
S911
T
S912
W
DEW
(YEL)
CAUTION
(RED)
S908
EJECT
S910
START/
STOP
S901
OFF
CAMERA
PLAYER
S902
REW
S903
S904
FF
S905
S906
(YEL)
(RED)
S907
REC
E, Australian MODEL
ONLY
FK-9 SWITCH BLOCK
SIDE A
SIDE B
CPA001
G OUT CHK
N.C.
OFFSET MIX
Y 0
Y 1
C 0
C 1
CAM Y
YH (MIX OUT)
CAM C
N.C.
ID (2)
N.C.
Y (LPF) OUT
VSUB CHK
AW ADJ
UN(CAM ADJ)
OFFSET CONT
N.C.
SHUTTER EN
CAM GND
IRIS DET
S/S GND
VC-60
BOARD
CN803
CN801
TR
TG
TB
UN(TC BLK)
TY BLK
TITLE A/D
TY MIX
DDS B+
SS 5V
HD
VD
CG BUSY
CG STB
DDS SI
DDS S0
UN(DDS SCK)
TITLE CS
SRAM CS
SS GND
EVF W
TO TI
TI-15
BOARD
UN(DDS SCK)
DDS S0
DDS SI
UN(SYSTEM RESET)
UN(CAM ADJ)
SERIAL CONT
EVF W
UN(ZOOM T)
UN(ZOOM W)
UN(EDIT SW)
S/S GND
W604
W801
23V
15V
-9V
CAM 5V
CAM GND
CAM GND
AF GND
AF UNREG
FP-186
(MOUNT)
FP-184
CN603
CN603
PAUSE LED
UN(REC S/S SW)
MI 5 (REC SW)
UN(CAM POWER SW)
REC LED
MI 4 (PAUSE SW)
S/S GND
UN(EJECT SW)
UN(ZOOM T)
MI 3 (STOP SW)
UN(ZOOM W)
MI 1 (PB SW)
MO 3 (COM)
MI 2 (FF SW)
DEW LED
MI 0 (REW SW)
CAUTION LED
UN(VTR POWER SW)
CN3
V021 (23V)
V022 (15V)
V023 (-9V)
V024 (CAM 5V)
GND V03 (CAM GND)
GND V03 (CAM GND)
GND V06 (AF GND)
V06 (AF UNREG)
CN501
W605
EVF 5V
VIDEO 5V
REG 5V
REG GND
REG GND
UN(VTR ON)
UN(CAM ON)
VTR UNREG
CAM UNREG
DRUM ERROR
CAP ERROR
DRUM VS
CAP VS
CAP FB
MOTOR GND
MOTOR GND
BATT SENSE
FP-181
(MOUNT)
CN605
CN2
V011 (EVF 5V)
V012 (VIDEO 5V)
V013 (REG 5V)
GND V1 (REG GND)
GND V1 (REG GND)
VC11 (UN(VTR ON))
VC21 (UN(CAM ON))
V04 (VTR UNREG)
V05 (CAM UNREG)
VC32 (DRUM ERROR)
VC31 (CAP ERROR)
V032 (DRUM VS)
V031 (CAP VS)
FB31 (CAP FB)
GND V3 (MOTOR GND)
GND V3 (MOTOR GND)
BATT SENSE (RV OUT)
BATTERY
CN1
V121 (CAM UNREG)
V131 (MOTOR UNREG)
V111 (VTR UNREG)
GND V1 (UNREG GND)
GND V1 (UNREG GND)
W909
CD-26
CN901
CAM UNREG
MOTOR UNREG
VTR UNREG
UNREG GND
UNREG GND
DC/DCCONV. CD111
TERMINAL BOARD
D PG
SENS GND
CN602
TAPE TOP (C)
DEW (S)
TAPE END (C)
UN(C LOCK SW)
S REEL (-)
S REEL (+)
T REEL (-)
T REEL (+)
TAPE LED (K)
SENSOR COM (+)
HALL COM (-)
ME/UN(MP)
REC PROOF
S/S GND
W502
CAP U
CAP U
C HALL VCC
CAP V
CAP V
H1(+)
H1(-)
H2(+)
H2(-)
H3(+)
H3(-)
C HALL GND
CAP W
CAP W
C FG VCC
C FG(-)
C FG GND
C FG(+)
FP-149
FP-182
(MOUNT)
CN502 CARD EDGE 15P
S991
CASSETTE
LOCK
FP-115
BOARD
REEL SENSOR
REC
PROOF
S992
ME/MP
M902
CAPSTAN MOTOR
Q991
END
SENSOR
D991
Q992
TOP
SENSOR

FRAME **FRAME**

22
23
S910
START/
STOP
ERY
ARD

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.

(In addition to this , the necessary note is printed in each block.)

- **For printed wiring boards.**
- ○— : indicated a lead wire mounted on the component side.
- —— : indicated a lead wire mounted on the conductor side.
- ■ : Parts mounted on the conductor side.
- ▒ Pattern from the side which enables seeing. } The inner two layers' patterns are not indicated.
- ▒ : Pattern of the rear side.*
- Circled numbers refer to waveforms.*
- (B) or (F), etc. of capacitors indicate the temperature characteristics.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the pattern face are indicated.

- **For schematic diagrams.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minuts side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4W unless otherwise noted.
  Chip resistor are 1/16W unless otherwise noted.
  kΩ : 1000Ω , MΩ : 1000kΩ .
- All capacitors are in μF unless otherwise noted. pF: μμF.
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ⊡ : nonflammable resistor.
- ⊟ : fusible resistor.
- ☐ : panel designation.
- △ : internal component.
- ☐ : adjustment for repeair.*
- ▬ : B+ Line.*
- ‒ ‒ ‒ : B– Line*.
- ⇨ : IN/OUT direction of (+, –) B LINE.*
- Circled numbers refer to waveforms.*

Note: The components identi- fied by mark ⚠ or dotted line with mark ⚠ are critical for safty.
Replace only with part number specified.

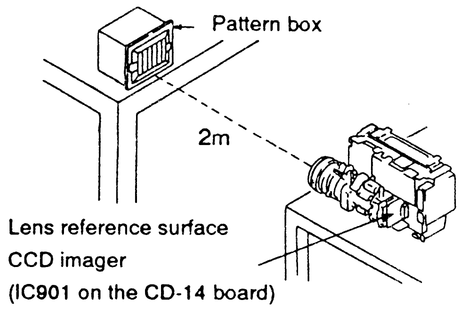
When indicating parts by reference number, please include the board name.

- **Measuring conditions voltage value and waveform.**

(CAMERA, DIGITAL TITLE block)

- The object is color bar chart of pattern box.
- Voltages are dc between ground and measurement points. Readings are taken with a digital multimeter (DC 10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

1. Connection



2. Adjust the distance so that the output waveform of Fig. a and the Fig. b can be obtain.

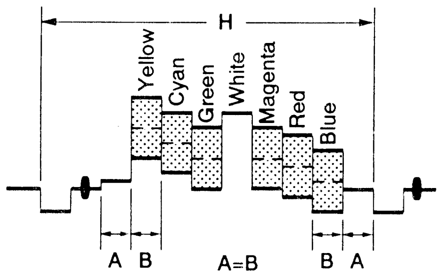


Fig. a (Video output terminal output waveform)

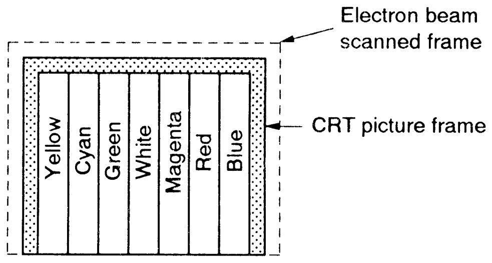


Fig. b (Picture on monitor TV)

(VIDEO, SERVO/SYSTEM CONTROL, MODE CONTROL, VIEW FINDER block)

- Voltages are dc between ground and measurement points.*
- Readings are taken with a color-bar signal input.*
- Readings are taken with a digital multimeter (DC10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

There are not the external input terminal (VIDEO/AUDIO IN) and REC switch in AEP, UK model. Accordingly, perform as the followings for REC mode.*

Signal input:	Refer to the video signal input method for the model without the external input terminal described in VIDEO BLOCK ADJUSTMENTS (page 293, Fig. 9-1).
REC mode:	Refer to the transition method to REC mode for the model without the external input terminal in the same Fig. 9-1.

- *: indicated by the color red.

VC-60 (CAMERA) PRINTED WIRING BOARDS

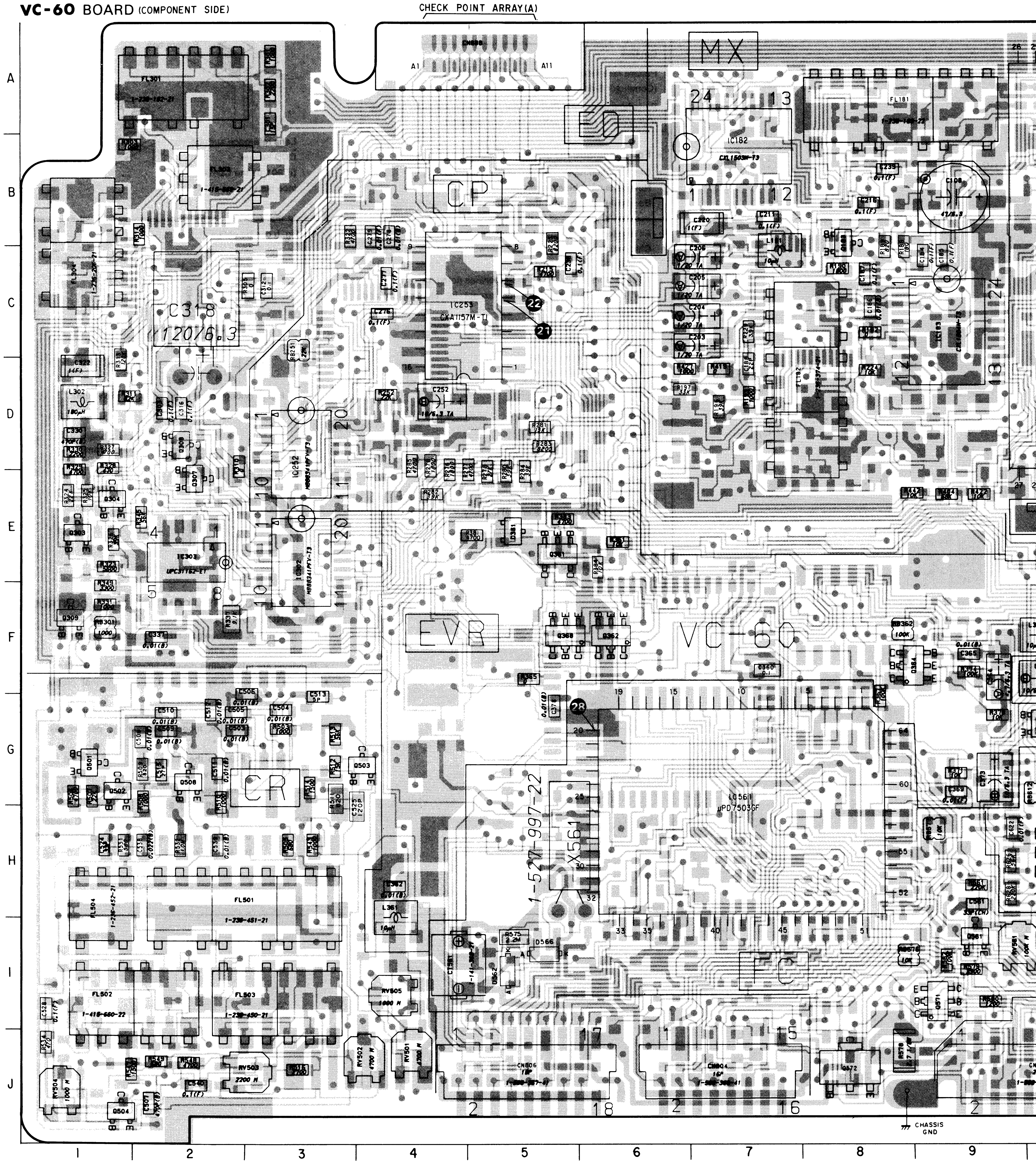
— Ref. No. VC-60 BOARD: 2000 series —

- **For printed wiring boards.**
- VC-60 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- Through hole (⊗) is omitted.

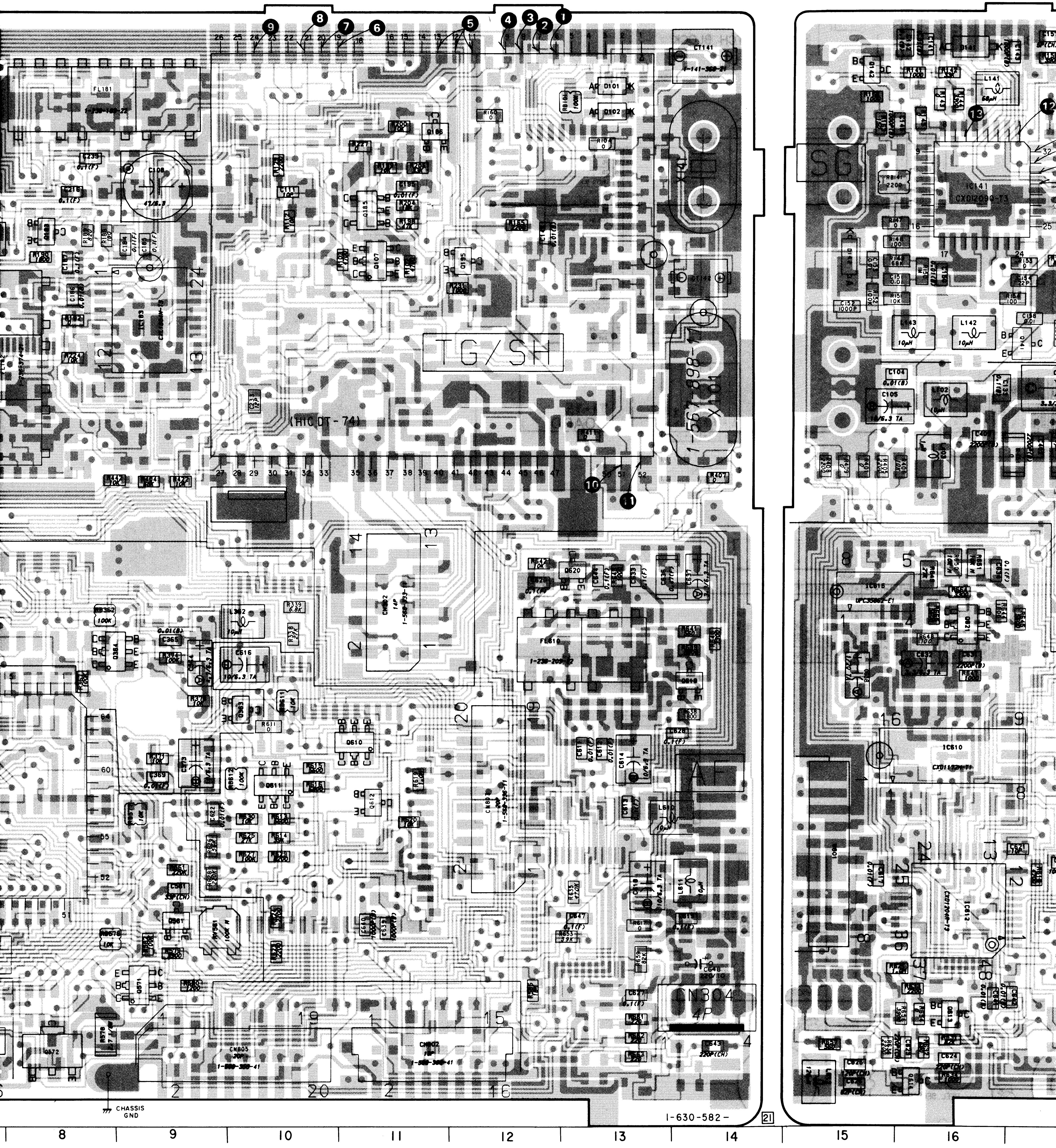
Caution:

Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the pattern face are indicated.

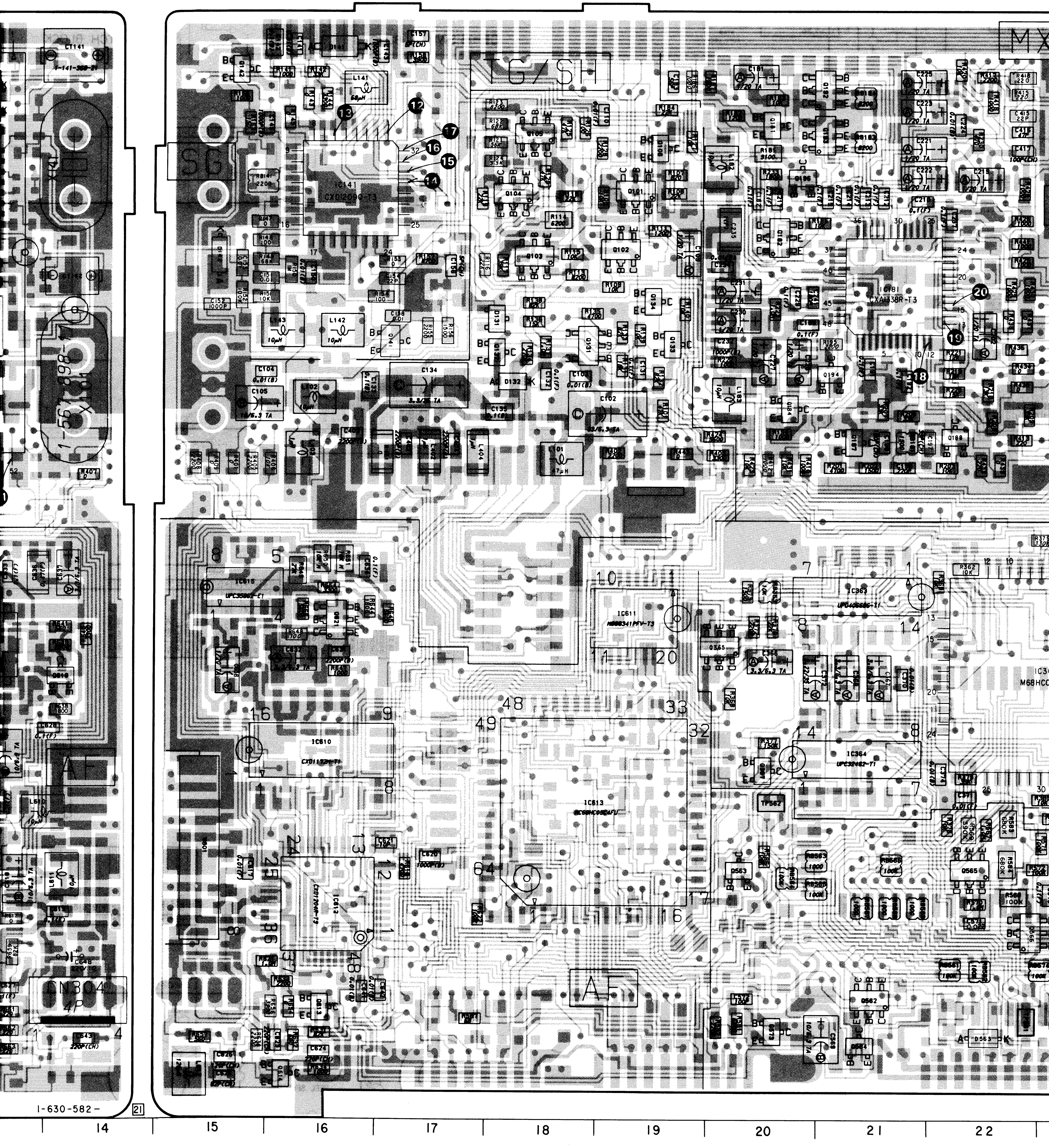
VC-60 BOARD (COMPONENT SIDE)

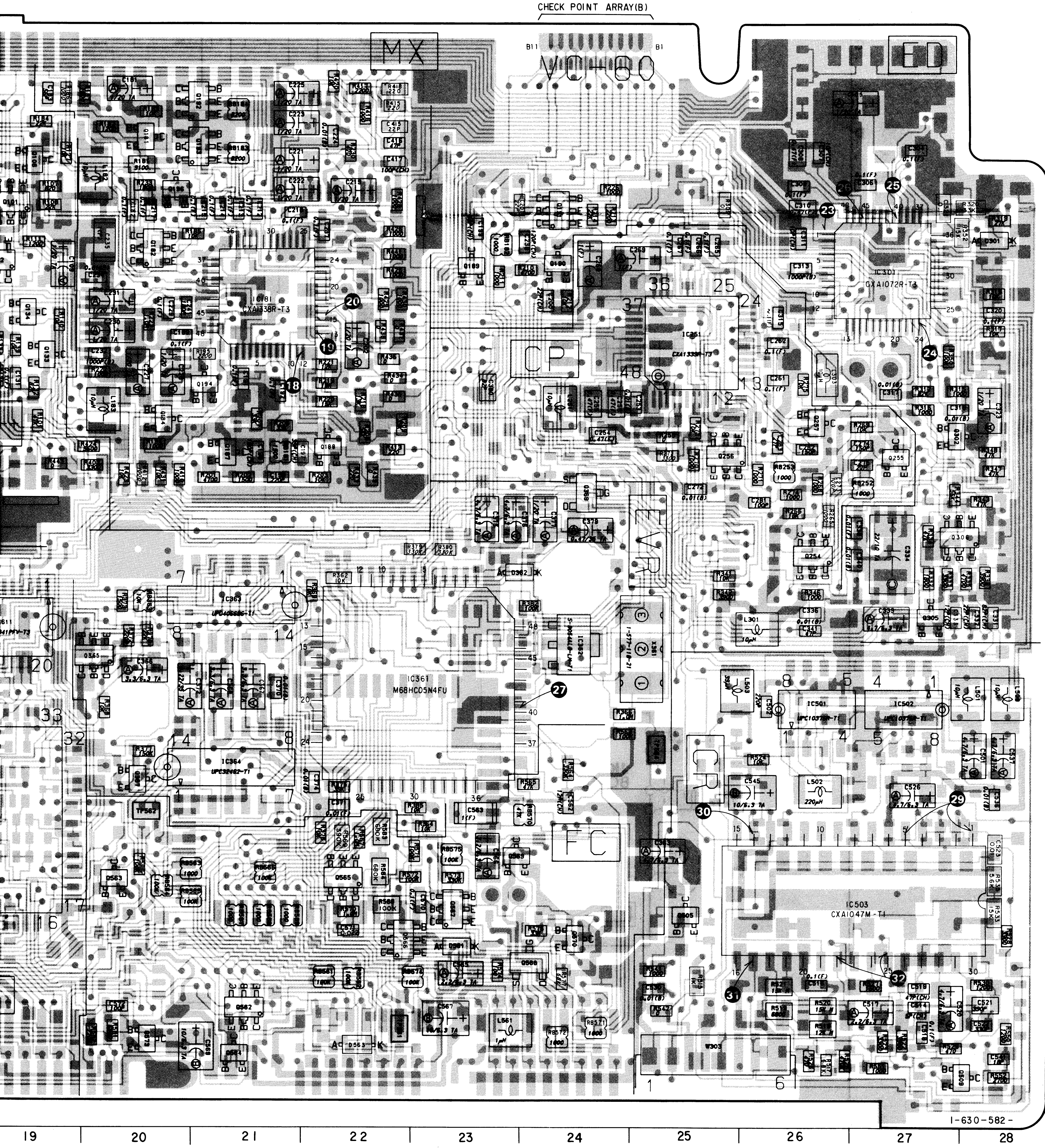

CHECK POINT ARRAY(A)
A1
A11
MX
CP
EVR
CR
VC-60
FC
IC182
CXL1503M-T3
IC253
CXA1157M-T1
IC252
MB88341PFV-T3
IC302
IC303
UPC3116Z-E1
IC561
µPD7503GF
IC183
X561
1-527-997-22
FL301
FL303
FL304
FL181
FL501
1-238-451-21
FL502
FL503
FL504
C318
120/6.3
C108
47/6.3
CN606
CN604
RV501
RV502
RV503
RV504
RV505
L302
L361
21
22
28
CHASSIS GND
A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
9

VC-60 BOARD (CONDUCTOR SIDE)


TG/SH
(HIC DT-74)
SG
AF
FL181
X181
CT141
IC141
CX012000-T3
IC610
IC612
CN802
CN803
CN804
4P
CN805
FL610
CHASSIS GND
1-630-582-
21
8
9
10
11
12
13
14
15
16

VC-60 BOARD (CONDUCTOR SIDE)


TG/SH
SG
MX
AF
IC141 CXD1200Q-T3
IC181 CXA1338R-T3
IC611 MB88341PFV-T3
IC363 UPD4066BG-T1
IC364 UPC324G2-T1
IC610 CXD1172M-T1
IC613
IC612
IC615 UPC358G2-E1
CN304 4P
1-630-582-
21
14
15
16
17
18
19
20
21
22


CHECK POINT ARRAY(B)
B11
B1
VC-80
MX
FD
CP
EVR
CR
FC
IC181
CXA1338R-T3
IC251
CXA1339R-T3
IC301
CXA1072R-T3
IC361
M68HC05N4FU
IC363
UPC4066BG-T1
IC364
UPC3246?-T1
IC362
IC501
IC502
IC503
CXA1047M-T1
1-630-582-
19
20
21
22
23
24
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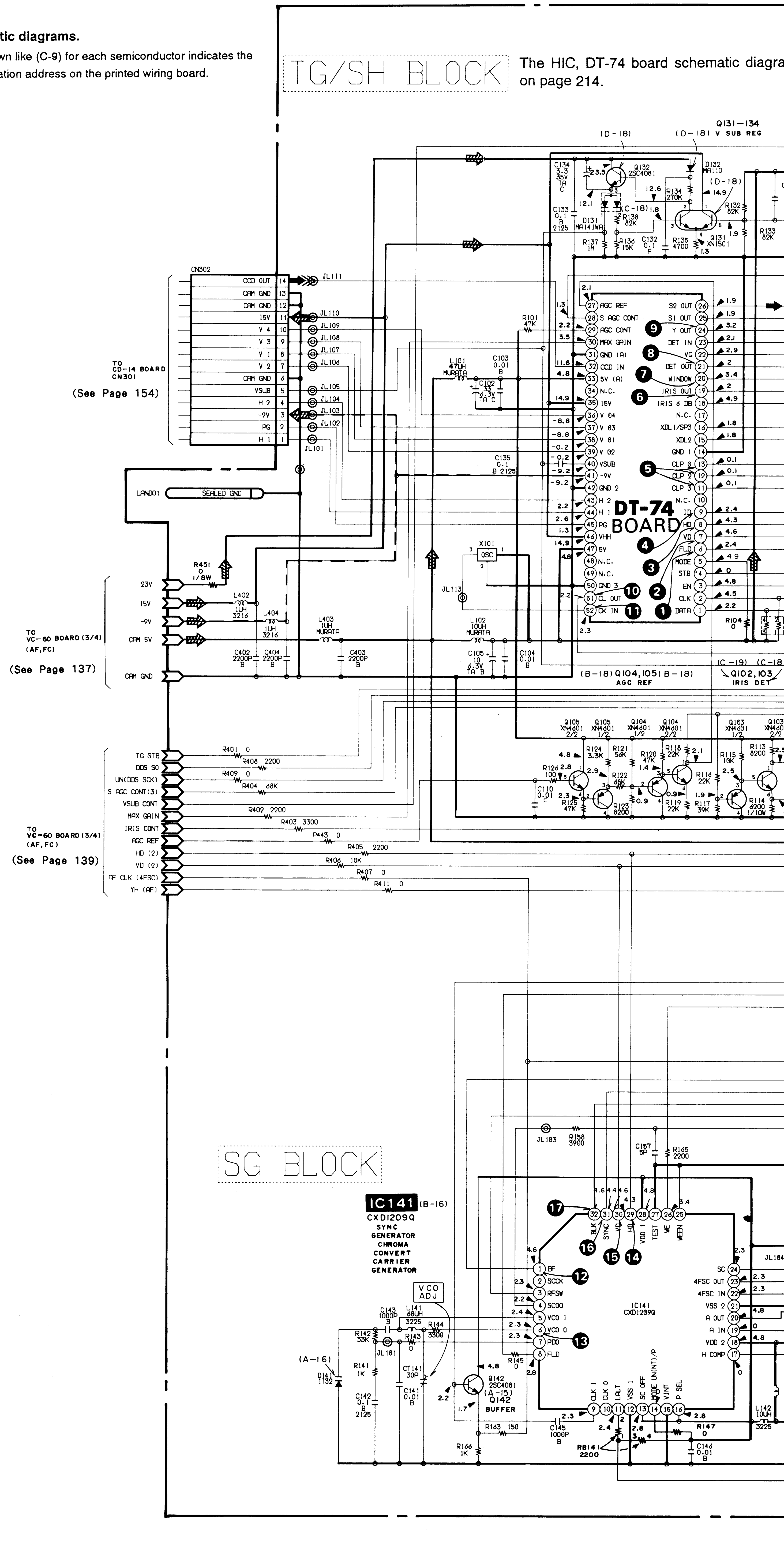
26
27
28

CAMERA **CAMERA**

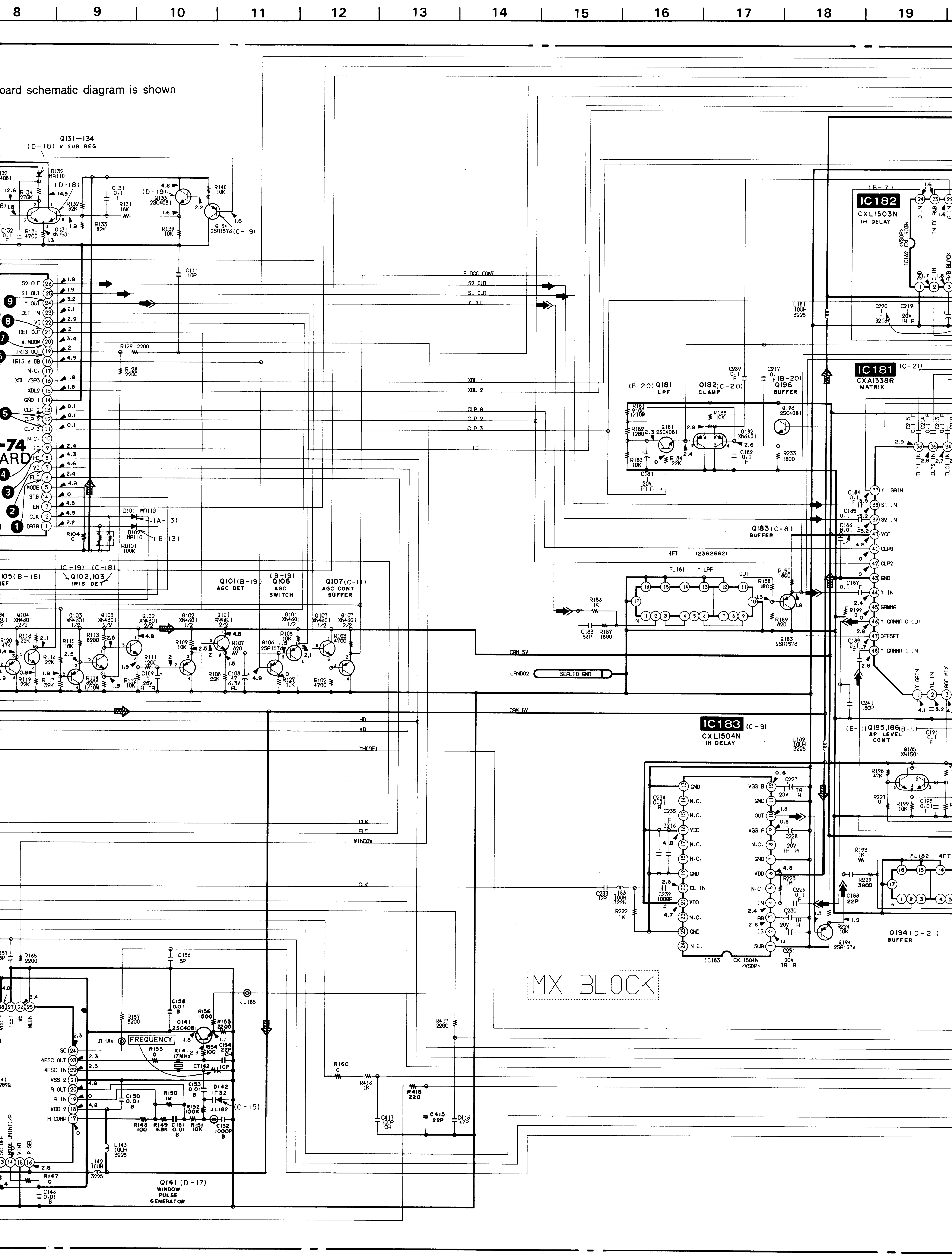
— Ref. No. VC-60 BOARD: 2000 series —

- **For schematic diagrams.**
- The code shown like (C-9) for each semiconductor indicates the position of location address on the printed wiring board.

The HIC, DT-74 board schematic diagra
on page 214.


TG/SH BLOCK
SG BLOCK
CN302
CCD OUT
CAM GND
15V
V 4
V 3
V 1
V 2
VSUB
H 2
-9V
PG
H 1
TO CD-14 BOARD CN301
(See Page 154)
JL111
JL110
JL109
JL108
JL107
JL106
JL105
JL104
JL103
JL102
JL101
LAND01
SEALED GND
R451 0 1/8W
23V
15V
-9V
CAM 5V
CAM GND
TO VC-60 BOARD (3/4) (AF,FC)
(See Page 137)
L402 1UH 3216
L404 1UH 3216
L403 1UH MURATA
C402 2200P B
C404 2200P B
C403 2200P B
TG STB
DDS SO
UN(DDS SCK)
S AGC CONT(3)
VSUB CONT
MAX GAIN
IRIS CONT
AGC REF
HD (2)
VD (2)
AF CLK (4FSC)
YH (AF)
TO VC-60 BOARD (3/4) (AF,FC)
(See Page 139)
R401 0
R408 2200
R409 0
R404 68K
R402 2200
R403 3300
R443 0
R405 2200
R406 10K
R407 0
R411 0
DT-74 BOARD
AGC REF
S AGC CONT
AGC CONT
MAX GAIN
GND (A)
CCD IN
5V (A)
N.C.
15V
V 04
V 03
V 01
V 02
VSUB
-9V
GND 2
H 2
H 1
PG
VHH
5V
GND 3
CL OUT
CK IN
S2 OUT
S1 OUT
Y OUT
DET IN
VG
DET OUT
WINDOW
IRIS OUT
IRIS 6 DB
XDL1/SP3
XDL2
GND 1
CLP 0
CLP 2
CLP 3
ID
HD
VD
FLD
MODE
STB
EN
CLK
DATA
X101 OSC
JL113
L101 47UH MURATA
C103 0.01 B
C102 33 6.3V TA C
C135 0.1 B 2125
R101 47K
L102 10UH MURATA
C105 10 6.3V TA B
C104 0.01 B
Q131-134 V SUB REG
Q132 2SC4081
D132 MA110
D131 MA141WA
Q131 XN1501
C134 3.3 35V TA C
C133 0.1 B 2125
R134 270K
R132 82K
R133 82K
R138 82K
R137 1M
R136 15K
C132 0.1 F
R135 4700
(B-18) Q104,105 (B-18) AGC REF
(C-19) (C-18) Q102,103 IRIS DET
Q105 XN4601 2/2
Q105 XN4601 1/2
Q104 XN4601 1/2
Q104 XN4601 2/2
Q103 XN4601 1/2
R124 3.3K
R121 56K
R120 47K
R118 22K
R126 100
R122 68K
R123 8200
R125 47K
R119 22K
R117 39K
R116 22K
R115 10K
R113 8200
R114 6200 1/10W
C110 0.01 F
R104 0
IC141 (B-16)
CXD1209Q
SYNC GENERATOR CHROMA CONVERT CARRIER GENERATOR
IC141 CXD1209Q
BF
SCCK
RFSW
SCOO
VCO I
VCO O
PDO
FLD
CLK I
CLK O
LALT
VSS 1
SC OFF
MODE UN(NT)/P
VINT
P SEL
BLK
SYNC
VD
HD
VDD 1
TEST
WE
WEEN
SC
4FSC OUT
4FSC IN
VSS 2
A OUT
A IN
VDD 2
H COMP
VCO ADJ
C143 1000P B
L141 68UH 3225
R144 3300
R143 0
R142 33K
JL181
D141 1T32
R141 1K
C142 0.1 B 2125
CT141 30P
C141 0.01 B
Q142 2SC4081 (A-15) Q142 BUFFER
R145 0
R163 150
R166 1K
C145 1000P B
RB141 2200
R147 0
C146 0.01 B
L142 10UH 3225
JL183
R158 3900
C157 5P
R165 2200
JL184

oard schematic diagram is shown


8
9
10
11
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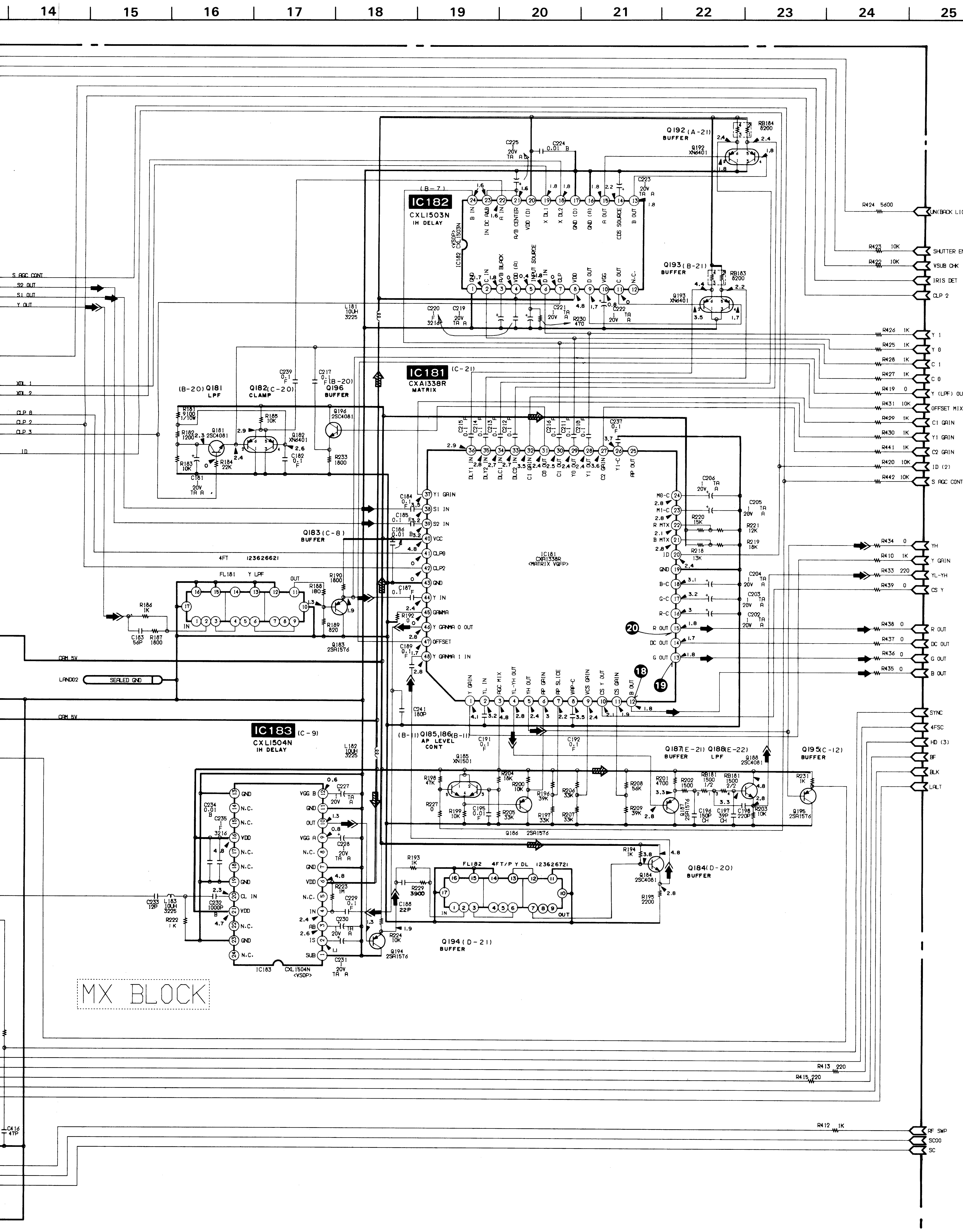
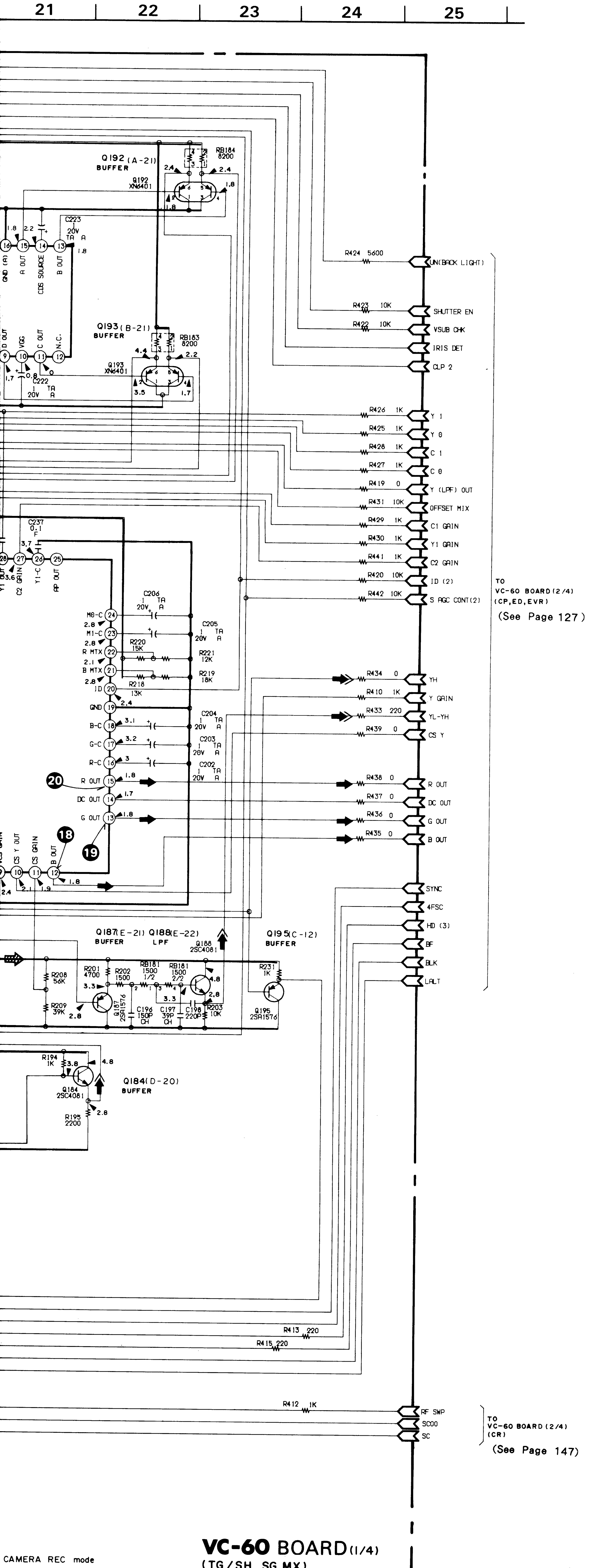
13
14
15
16
17
18
19
Q131—134 (D-18) V SUB REG
-74
ARD
S2 OUT
S1 OUT
Y OUT
DET IN
VG
DET OUT
WINDOW
IRIS OUT
IRIS 6 DB
N.C.
XDL1/SP3
XDL2
GND 1
CLP 0
CLP 2
CLP 3
ID
HD
VD
FLD
MODE
STB
EN
CLK
DATA
Q102,103 IRIS DET
Q101 AGC DET
Q106 AGC SWITCH
Q107 AGC CONT BUFFER
S AGC CONT
S2 OUT
S1 OUT
Y OUT
XDL 1
XDL 2
CLP 0
CLP 2
CLP 3
ID
CAM 5V
LAND02
SEALED GND
HD
VD
YH(AF)
CLK
FLD
WINDOW
CLK
Q181 LPF
Q182 CLAMP
Q196 BUFFER
Q183 BUFFER
FL181 Y LPF
IC182 CXL1503N 1H DELAY
IC181 CXA1338R MATRIX
IC183 CXL1504N 1H DELAY
Q185,186 AP LEVEL CONT
Q194 BUFFER
FL182
MX BLOCK
FREQUENCY
JL184
JL185
Q141 WINDOW PULSE GENERATOR
SC
4FSC OUT
4FSC IN
VSS 2
A OUT
A IN
VDD 2
H COMP


14
15
16
17
18
19
20
21
22
23
24
25
IC182
CXL1503N
1H DELAY
IC181
CXA1338R
MATRIX
IC183
CXL1504N
1H DELAY
(B-20) Q181 LPF
Q182 (C-20) CLAMP
Q196 BUFFER
Q183 (C-8) BUFFER
FL181 Y LPF
Q192 (A-21) BUFFER
Q193 (B-21) BUFFER
(B-11) Q185,186 (B-11) AP LEVEL CONT
Q187 (E-21) BUFFER
Q188 (E-22) LPF
Q195 (C-12) BUFFER
Q184 (D-20) BUFFER
Q194 (D-21) BUFFER
FL182 4FT/P Y DL 123626721
4FT 123626621
MX BLOCK
S AGC CONT
S2 OUT
S1 OUT
Y OUT
XDL 1
XDL 2
CLP 0
CLP 2
CLP 3
ID
CAM 5V
LAND02
SEALED GND
UN(BACK LIG
SHUTTER EN
VSUB CHK
IRIS DET
CLP 2
Y 1
Y 0
C 1
C 0
Y (LPF) OU
OFFSET MIX
C1 GAIN
Y1 GAIN
C2 GAIN
ID (2)
S AGC CONT
YH
Y GAIN
YL-YH
CS Y
R OUT
DC OUT
G OUT
B OUT
SYNC
4FSC
HD (3)
BF
BLK
LALT
RF SWP
SCOO
SC
18
19
20

no mark : CAMERA REC mode

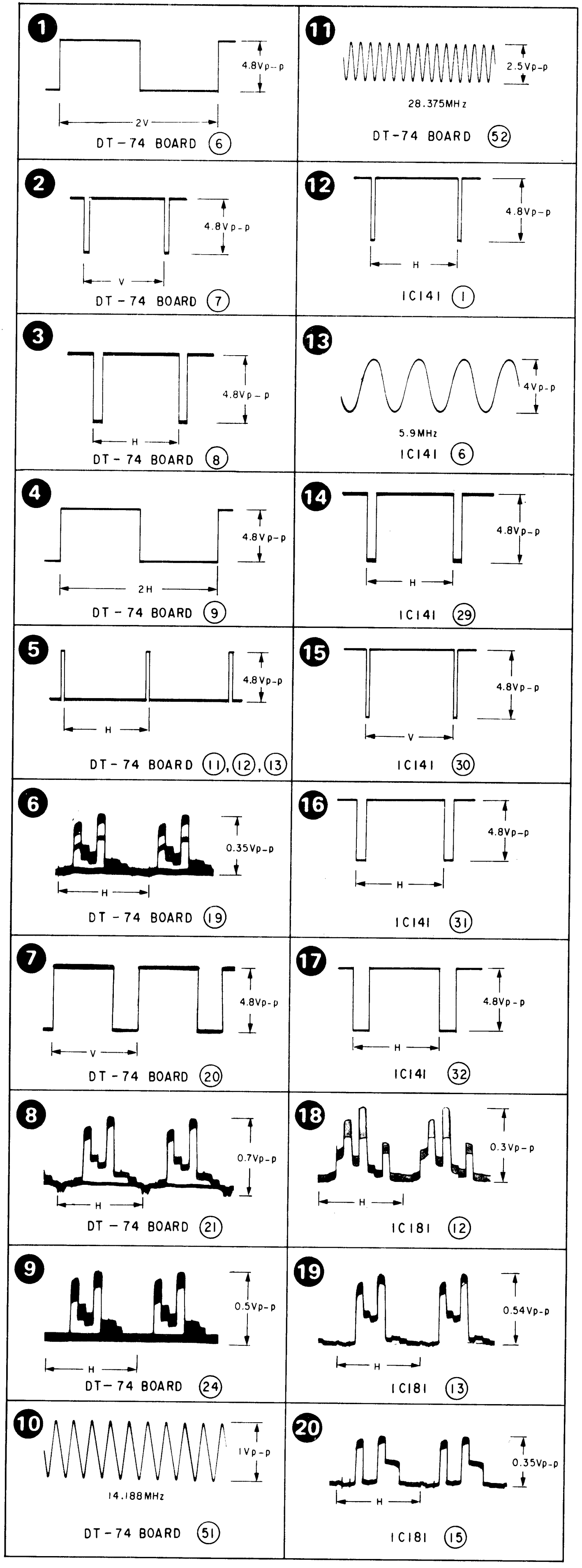
VC-60 BOARD (1/4)
(TG/SH, SG,MX)


21
22
23
24
25
Q192 (A-21) BUFFER
Q192 XN6401
RB184 8200
Q193 (B-21) BUFFER
Q193 XN6401
RB183 8200
C223 20V TA
C222 20V TA
R424 5600
UN(BACK LIGHT)
R423 10K
SHUTTER EN
R422 10K
VSUB CHK
IRIS DET
CLP 2
R426 1K
Y 1
R425 1K
Y 0
R428 1K
C 1
R427 1K
C 0
R419 0
Y (LPF) OUT
R431 10K
OFFSET MIX
R429 1K
C1 GAIN
R430 1K
Y1 GAIN
R441 1K
C2 GAIN
R420 10K
ID (2)
R442 10K
S AGC CONT(2)
TO VC-60 BOARD (2/4) (CP,ED,EVR)
(See Page 127)
C237 0.1
C206 20V TA
C205 20V TA
R220 15K
R221 12K
R219 18K
R218 13K
C204 20V TA
C203 20V TA
C202 20V TA
MB-C
MI-C
R MTX
B MTX
ID
GND
B-C
G-C
R-C
R OUT
DC OUT
G OUT
R434 0
YH
R410 1K
Y GAIN
R433 220
YL-YH
R439 0
CS Y
R438 0
R OUT
R437 0
DC OUT
R436 0
G OUT
R435 0
B OUT
SYNC
4FSC
HD (3)
BF
BLK
LALT
Q187(E-21) Q188(E-22) BUFFER LPF
Q188 2SC4081
Q195(C-12) BUFFER
Q195 2SA1576
R208 56K
R209 39K
R201 4700
R202 1500
RB181 1500 1/2
RB181 1500 2/2
C196 150P CH
C197 39P CH
C198 220P
R203 10K
R231 1K
Q187 2SA1576
R194 1K
Q184(D-20) BUFFER
Q184 2SC4081
R195 2200
R413 220
R415 220
R412 1K
RF SWP
SCOO
SC
TO VC-60 BOARD (2/4) (CR)
(See Page 147)

CAMERA REC mode

VC-60 BOARD(1/4)
(TG/SH, SG,MX)

VC-60 BOARD (TG/SH, SG, MX)



- Signal path

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC	➡	➡	⇛	
PB				

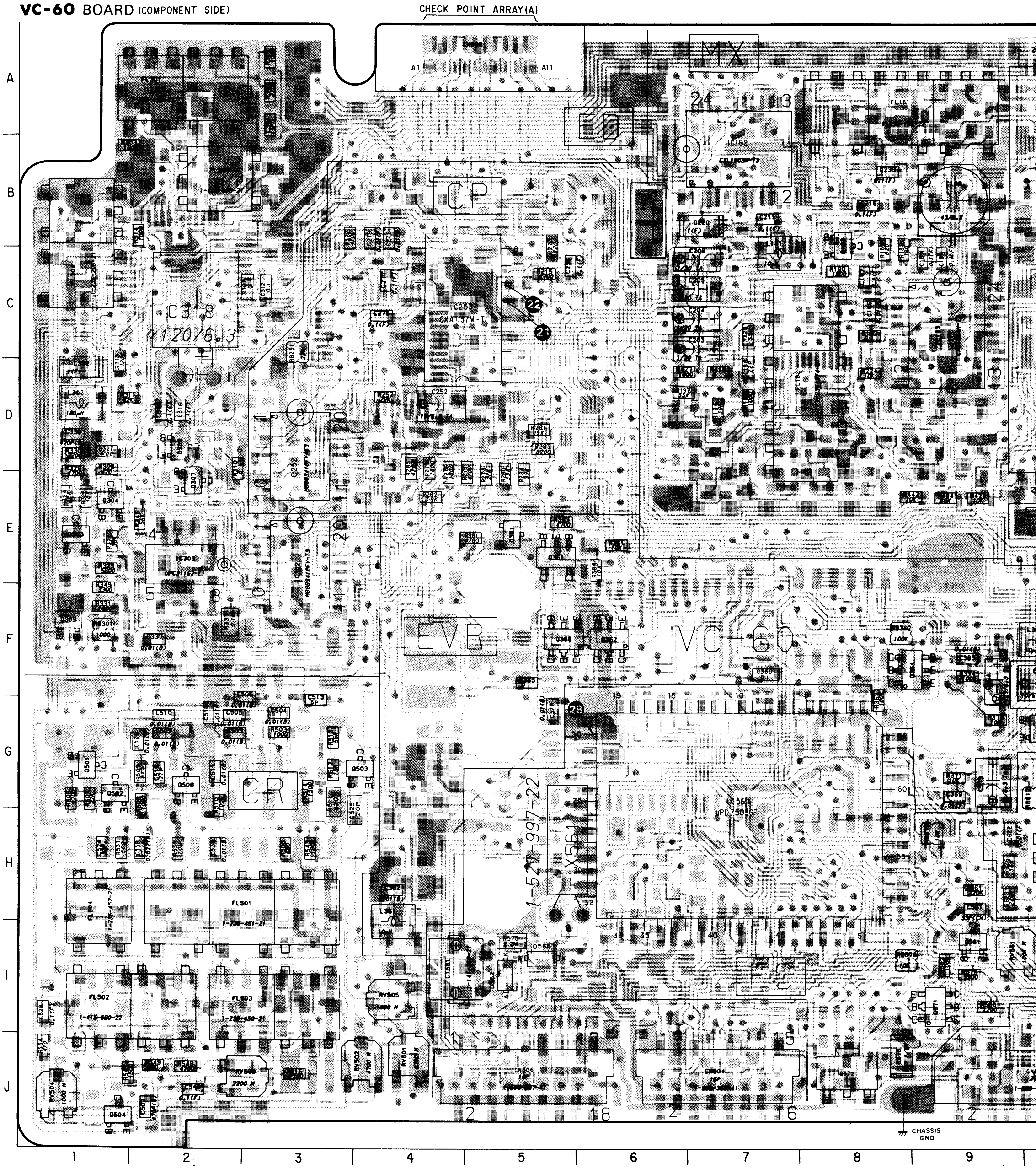
VC-60 (CAMERA) PRINTED WIRING BOARDS

— Ref. No. VC-60 BOARD: 2000 series —

- **For printed wiring boards.**
- VC-60 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- Through hole (⊗) is omitted.

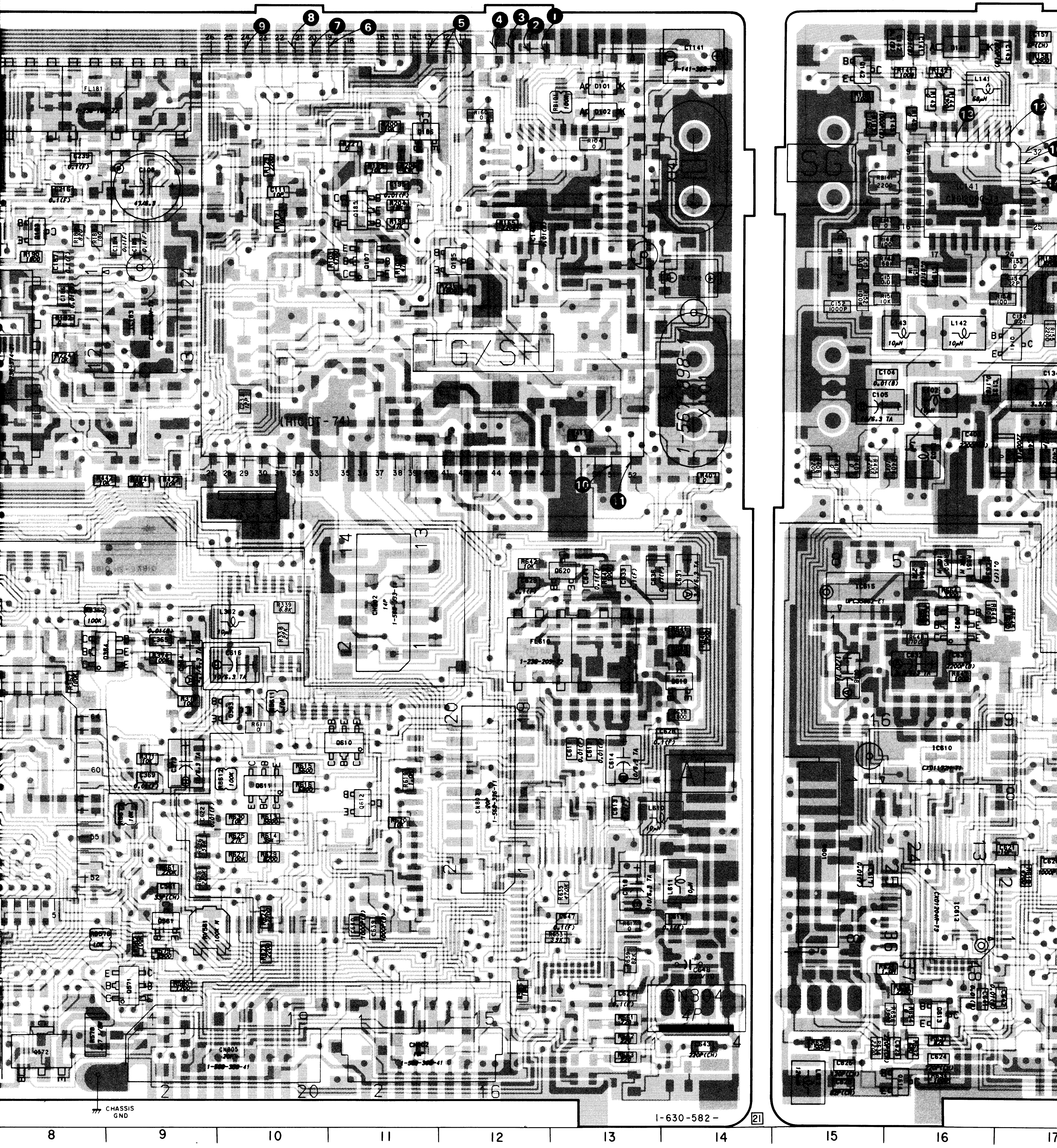
Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the pattern face are indicated.

VC-60 BOARD (COMPONENT SIDE)



CHECK POINT ARRAY(A)
A1
A11
MX
CP
EVR
VC-60
CR
IC253
CXA1157M-T1
IC182
CXL1503M-T3
IC252
MB88341PFV-T3
IC302
UPC3116Z-E1
IC561
μPD7503GF
X561
1-527-997-22
C318
120/6.3
FL501
1-239-451-21
FL502
1-415-660-22
FL503
1-239-450-21
FL504
1-239-452-21
FL181
L302
180μH
RV501
RV502
RV503
RV504
RV505
CN504
CN506
21
22
28
CHASSIS GND
A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
9

VC-60 BOARD (CONDUCTOR SIDE)


TG/SH
SG
AF
CN804 4P
IC141
IC610
IC612
IC615
CN802 14P
CN803 20P
CN805 20P
CN812 16P
FL181
FL610
CT141
CHASSIS GND
1-630-582-
21
8
9
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11
12
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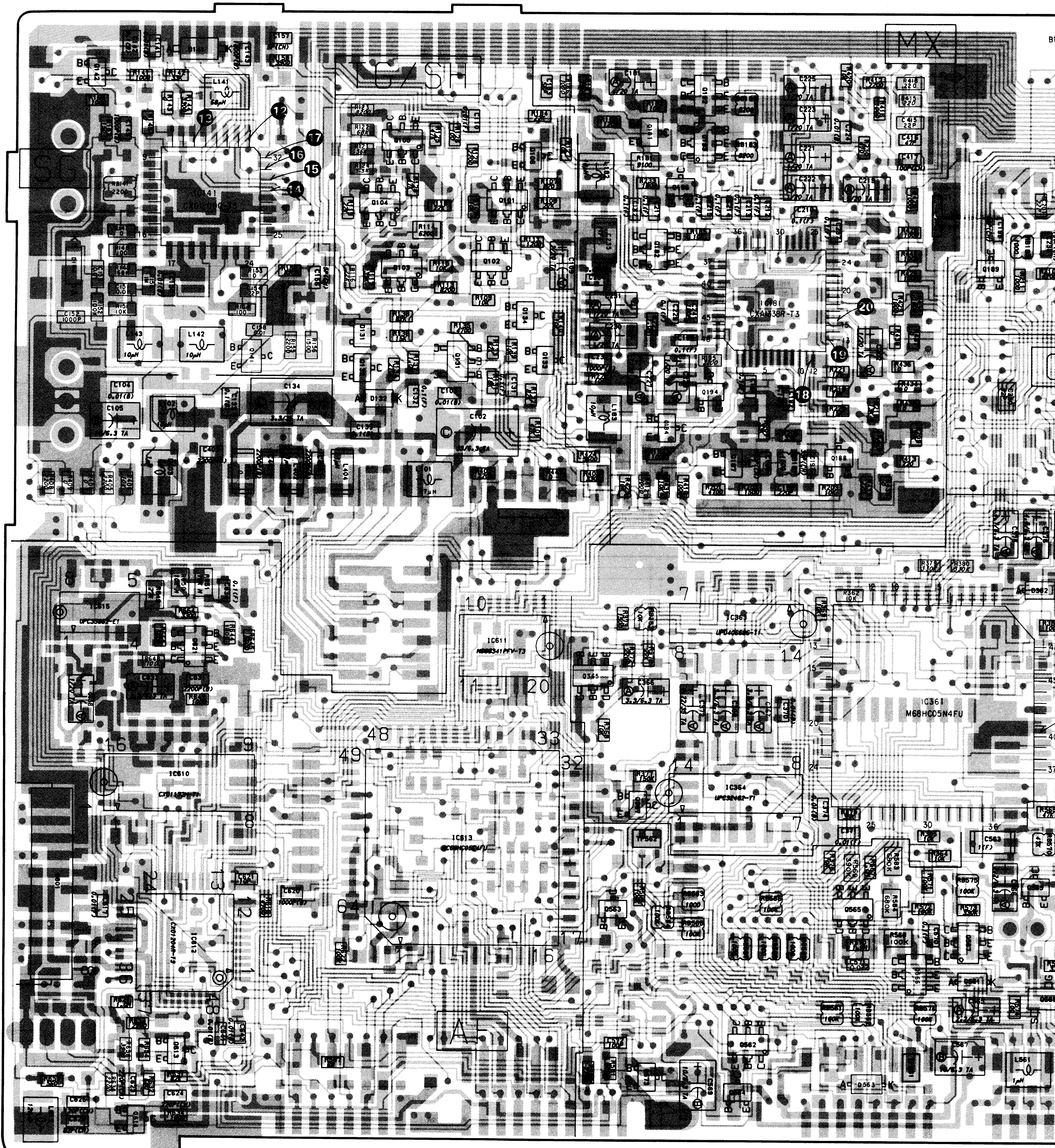
14
15
16
17

VC-60 BOARD (CONDUCTOR SIDE)



MX
SG
G/SH
A
IC141
IC181
CXA1338R-T3
IC361
M68HC05N4FU
IC363
IC364
IC610
IC611
IC612
IC613
IC615
12
13
14
15
16
17
18
19
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21
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16
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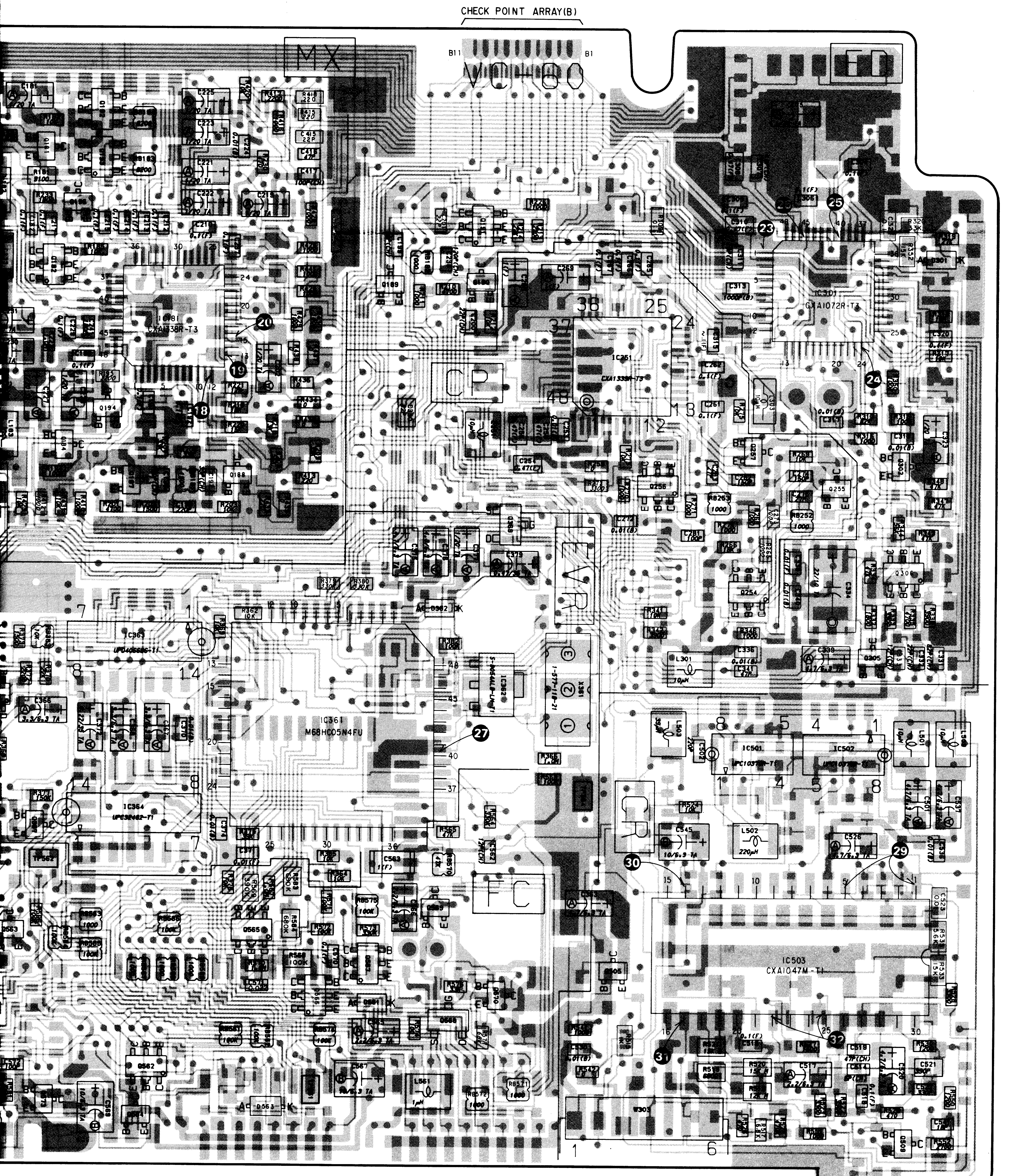
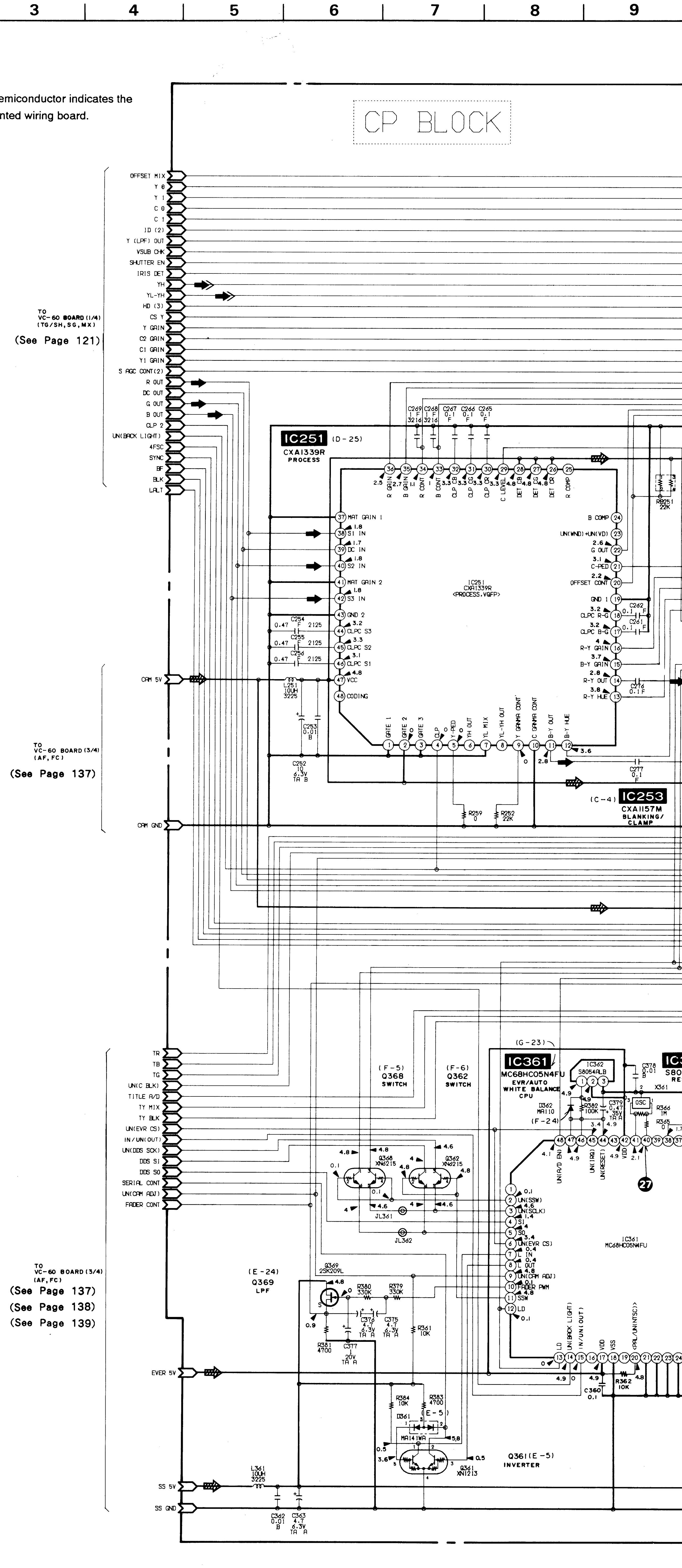
22
23

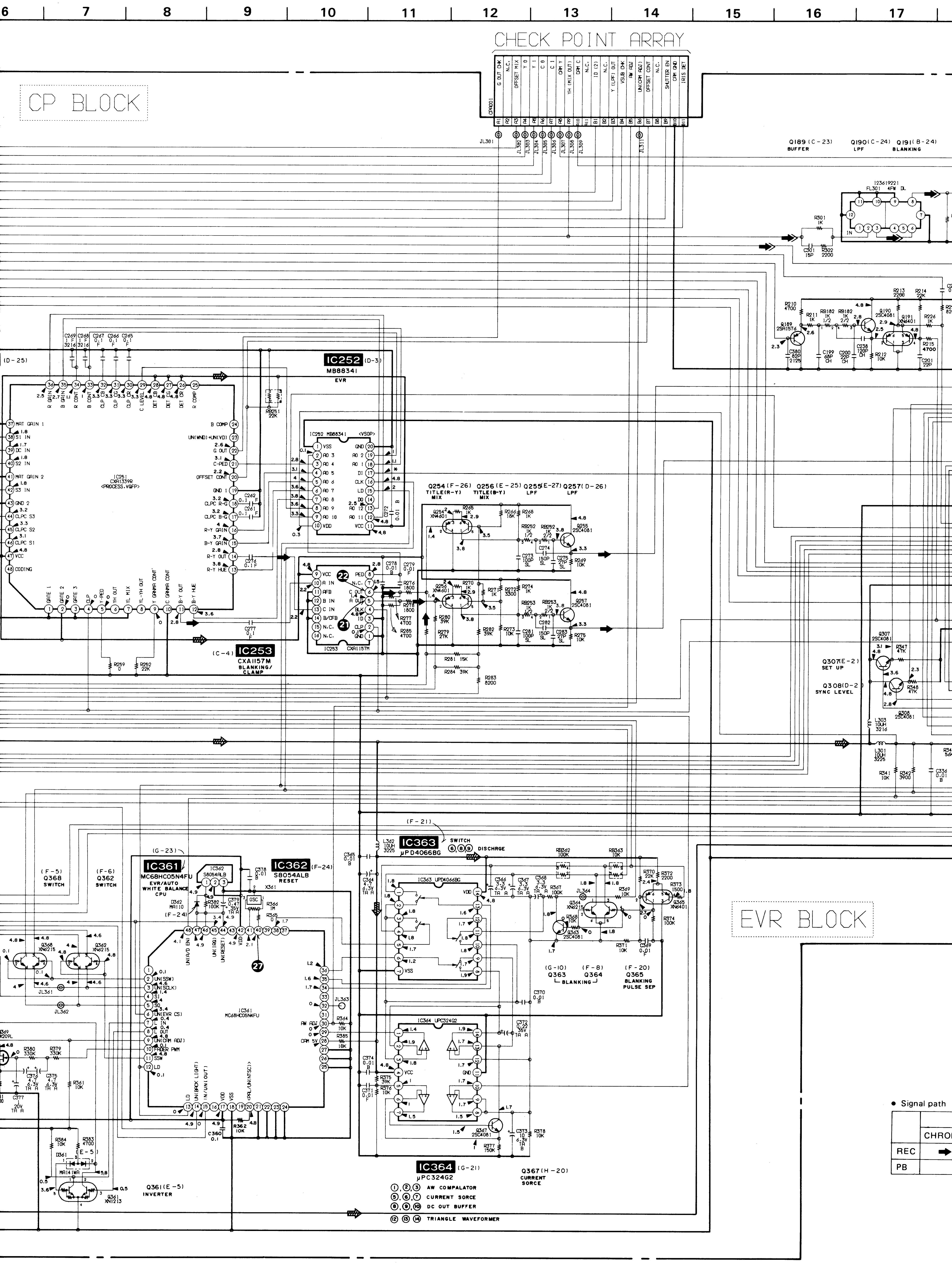

CHECK POINT ARRAY(B)
B11
B1
MX
VC-60
ED
CP
VR
FC
CR
IC181
CXA1338R-T3
IC251
CXA1339M-T3
IC301
CXA1072R-T3
IC361
M68HC05N4FU
IC362
IC363
UPD4066BG-T1
IC364
UPC324G2-T1
IC501
UPC1037GR-T1
IC502
IC503
CXA1047M-T1
L301
L502
220µH
L561
1µH
W303
I-630-582-
20
21
22
23
24
25
26
27
28
21

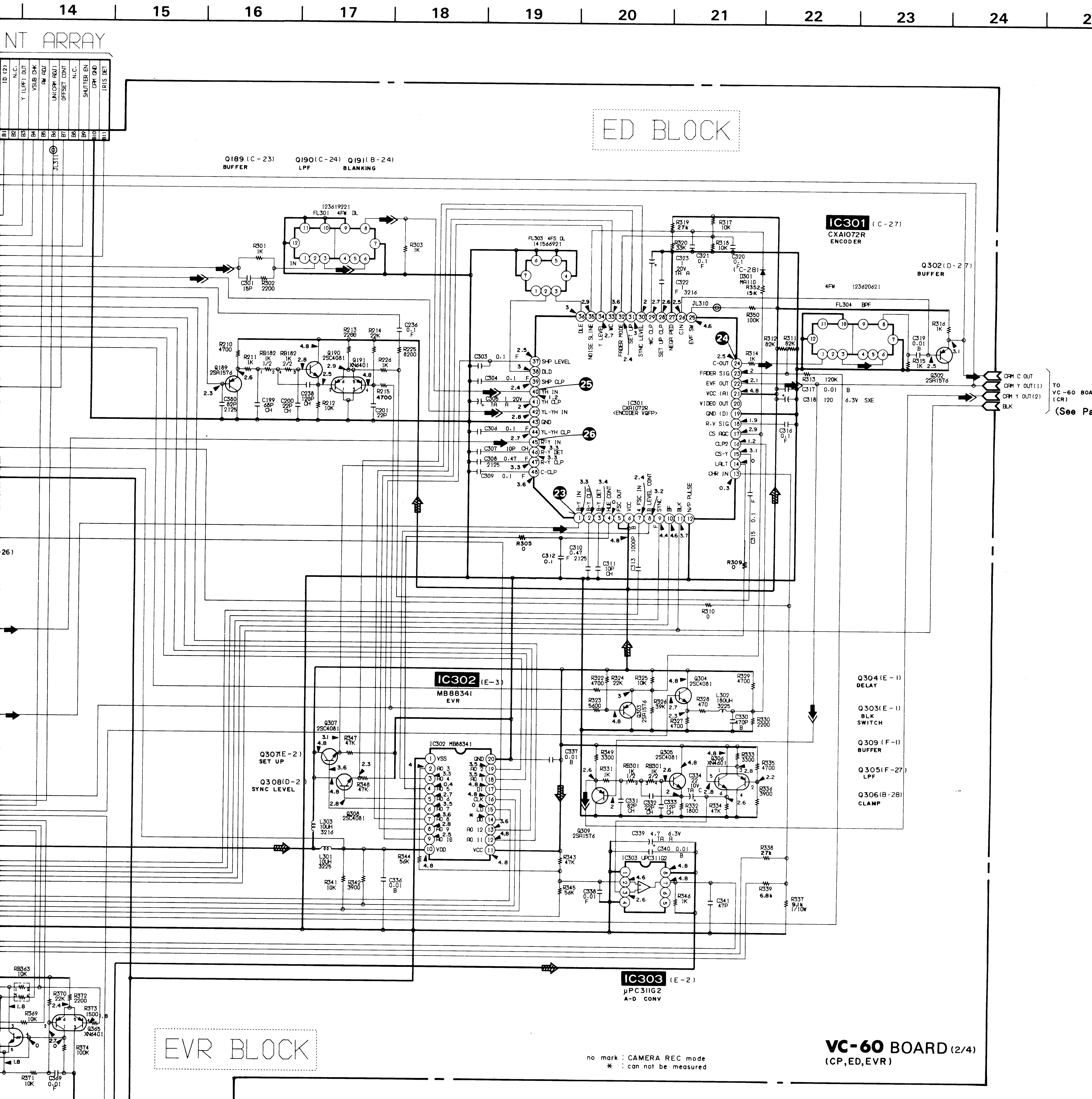
CAMERA **CAMERA**

— Ref. No. VC-60 BOARD: 2000 series —

- **For schematic diagrams.**
- The code shown like (C-9) for each semiconductor indicates the position of location address on the printed wiring board.


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
CP BLOCK
OFFSET MIX
Y 0
Y 1
C 0
C 1
ID (2)
Y (LPF) OUT
VSUB CHK
SHUTTER EN
IRIS DET
YH
YL-YH
HD (3)
CS Y
Y GAIN
C2 GAIN
C1 GAIN
Y1 GAIN
S AGC CONT(2)
R OUT
DC OUT
G OUT
B OUT
CLP 2
UN(BACK LIGHT)
4FSC
SYNC
BF
BLK
LALT
TO VC-60 BOARD (1/4) (TG/SH,SG,MX)
(See Page 121)
IC251 (D-25)
CXA1339R
PROCESS
IC251
CXA1339R
<PROCESS.VQFP>
MAT GAIN 1
S1 IN
DC IN
S2 IN
MAT GAIN 2
S3 IN
GND 2
CLPC S3
CLPC S2
CLPC S1
VCC
CODING
B COMP
UN(WND) +UN(VD)
G OUT
C-PED
OFFSET CONT
GND 1
CLPC R-G
CLPC B-G
R-Y GAIN
B-Y GAIN
R-Y OUT
R-Y HUE
GATE 1
GATE 2
GATE 3
CLP
Y-PED
YH OUT
YL MIX
YL-YH OUT
Y GAMMA CONT
C GAMMA CONT
B-Y OUT
B-Y HUE
R GAIN
B GAIN
B CONT
R CONT
CLP
C LEVEL
DET
R COMP
R8251 22K
C254 0.47 F 2125
C255 0.47 F 2125
C256 0.47 F 2125
L251 10UH 3225
C253 0.01 B
C252 10 6.3V TA B
C262 0.1 F
C261 0.1 F
C276 0.1 F
C277 0.1 F
R259 0
R252 22K
(C-4) IC253
CXA1157M
BLANKING/CLAMP
CAM 5V
CAM GND
TO VC-60 BOARD (3/4) (AF,FC)
(See Page 137)
TR
TB
TG
UN(C BLK)
TITLE A/D
TY MIX
TY BLK
UN(EVR CS)
IN/UN(OUT)
UN(DDS SCK)
DDS SI
DDS SO
SERIAL CONT
UN(CAM ADJ)
FADER CONT
(F-5) Q368 SWITCH
(F-6) Q362 SWITCH
Q368 XN6215
Q362 XN6215
JL361
JL362
(G-23)
IC361
MC68HC05N4FU
EVR/AUTO WHITE BALANCE CPU
IC362 S8054ALB
D362 MA110 (F-24)
R382 100K
C379 0.47 35V TA A
C378 0.01 B
X361
OSC
R366 1M
R365
UN(A/D EN)
UN(IRQ)
UN(RESET)
VDD
27
UN(SSW)
UN(SCLK)
SI
SO
UN(EVR CS)
L IN
L OUT
UN(CAM ADJ)
FADER PWM
SSW
LD
UN(BACK LIGHT)
IN/UN(OUT)
VDD
VSS
<PAL/UN(NTSC)>
IC361 MC68HC05N4FU
R362 10K
C360 0.1
TO VC-60 BOARD (3/4) (AF,FC)
(See Page 137)
(See Page 138)
(See Page 139)
(E-24) Q369 LPF
Q369 2SK209L
R380 330K
R379 330K
C376 4.7 6.3V TA A
C375 4.7 6.3V TA A
R361 10K
R381 4700
C377 20V TA A
EVER 5V
R384 10K
R383 4700
D361 MA141WA
(E-5)
Q361 (E-5) INVERTER
Q361 XN1213
L361 10UH 3225
SS 5V
SS GND
C362 0.01 B
C363 4.7 6.3V TA A


6
7
8
9
10
11
12
13
14
15
16
17
CHECK POINT ARRAY
G OUT CHK
N.C.
OFFSET MIX
Y 0
Y 1
C 0
C 1
CAM Y
YH (MIX OUT)
CAM C
ID (2)
N.C.
Y (LPF) OUT
VSUB CHK
AW ADJ
UN(CAM ADJ)
OFFSET CONT
N.C.
SHUTTER EN
CAM GND
IRIS DET
CP BLOCK
Q189 (C-23) BUFFER
Q190 (C-24) LPF
Q191 (B-24) BLANKING
FL301 4FM DL
IC252 (D-3)
MB88341
EVR
IC251
CXA1339R
<PROCESS.VQFP>
IC252 MB88341 <VSOP>
Q254 (F-26) TITLE(R-Y) MIX
Q256 (E-25) TITLE(B-Y) MIX
Q255 (E-27) LPF
Q257 (D-26) LPF
IC253 (C-4)
CXA1157M
BLANKING/CLAMP
Q307 (E-2) SET UP
Q308 (D-2) SYNC LEVEL
IC361 (G-23)
MC68HC05N4FU
EVR/AUTO WHITE BALANCE CPU
IC362 (F-24)
S8054ALB
RESET
IC363 (F-21)
µPD4066BG
SWITCH
⑥,⑧,⑨ DISCHRGE
(F-5) Q368 SWITCH
(F-6) Q362 SWITCH
(G-10) Q363
(F-8) Q364
BLANKING
(F-20) Q365
BLANKING PULSE SEP
EVR BLOCK
IC364 (G-21)
µPC324G2
①,②,③ AW COMPALATOR
⑤,⑥,⑦ CURRENT SORCE
⑧,⑨,⑩ DC OUT BUFFER
⑫ ⑬ ⑭ TRIANGLE WAVEFORMER
Q367 (H-20) CURRENT SORCE
Q361 (E-5) INVERTER
• Signal path
CHRO
REC
PB

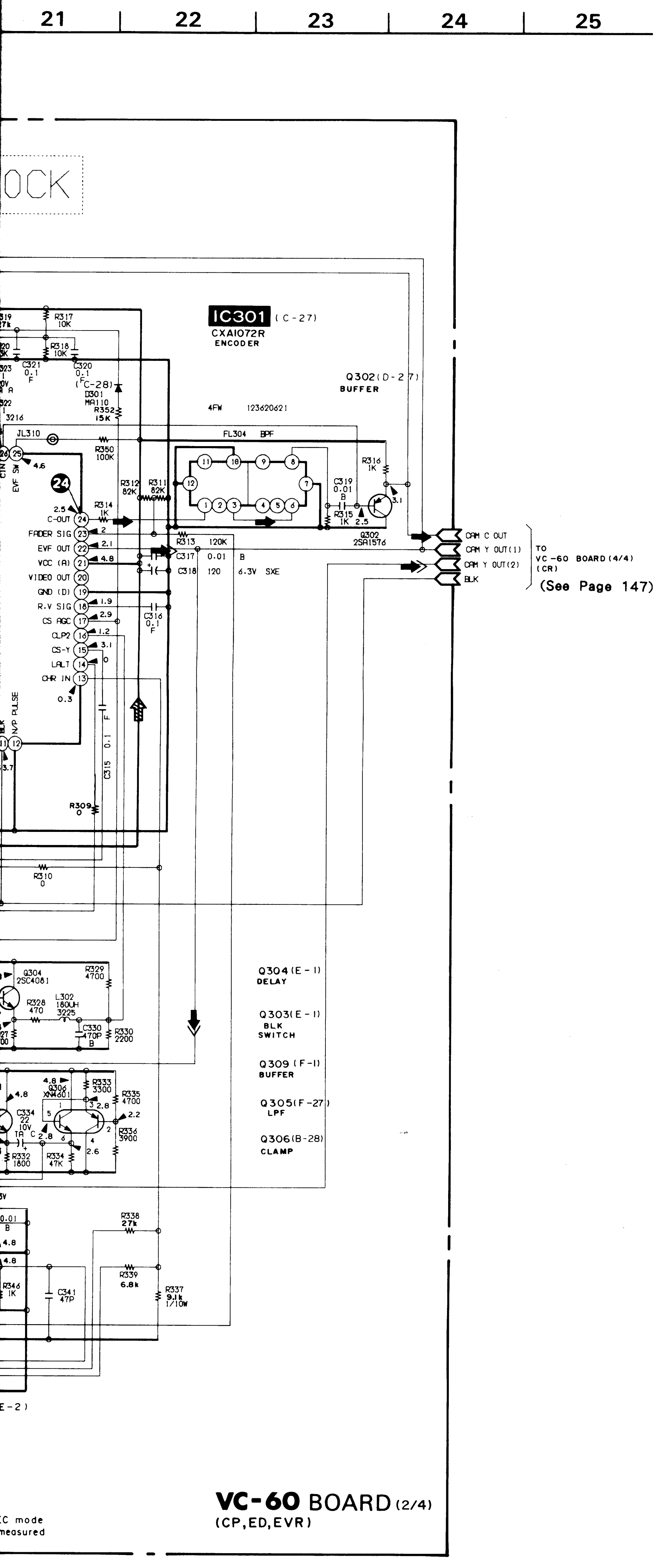

14
15
16
17
18
19
20
21
22
23
24
NT ARRAY
ED BLOCK
EVR BLOCK
Q189 (C-23) BUFFER
Q190 (C-24) LPF
Q191 (B-24) BLANKING
FL301 4FW DL
FL303 4FS DL
FL304 BPF
IC301 (C-27)
CXA1072R
ENCODER
Q302 (D-27) BUFFER
CAM C OUT
CAM Y OUT (1)
CAM Y OUT (2)
BLK
TO VC-60 BOARD (CR)
(See Pa
IC302 (E-3)
MB88341
EVR
Q307 (E-2) SET UP
Q308 (D-2) SYNC LEVEL
IC303 (E-2)
µPC311G2
A-D CONV
Q304 (E-1) DELAY
Q303 (E-1) BLK SWITCH
Q309 (F-1) BUFFER
Q305 (F-27) LPF
Q306 (B-28) CLAMP
Q365 (F-20) BLANKING PULSE SEP
SHP LEVEL
DLD
SHP CLP
YH IN
YH CLP
YL-YH IN
GND
YL-YH CLP
R-Y IN
R-Y DET
R-Y CLP
C-CLP
FADER SIG
EVF OUT
VCC (A)
VIDEO OUT
GND (D)
R.V SIG
CS AGC
CLP2
CS-Y
LALT
CHR IN
C-OUT
23
24
25
26

VC-60 BOARD (2/4)
(CP,ED,EVR)

no mark : CAMERA REC mode
* : can not be measured

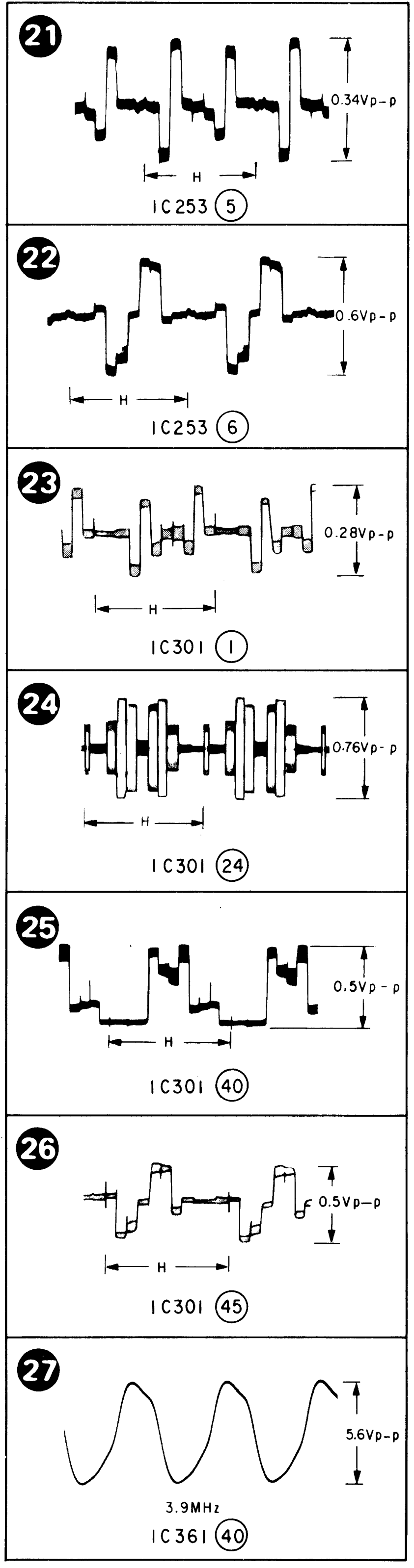
- Signal path

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC	➡	⇛		
PB				


21
22
23
24
25
OCK
IC301 (C-27)
CXA1072R
ENCODER
Q302 (D-27)
BUFFER
4FW 123620621
R317 10K
R318 10K
C321 0.1 F
C320 0.1 F
(C-28)
D301 MA110
R352 15K
3216
JL310
R350 100K
FL304 BPF
R316 1K
C319 0.01 B
R315 1K
2.5
3.1
Q302 2SA1576
R312 82K
R311 82K
R314 1K
R313 120K
C317 0.01 B
C318 120 6.3V SXE
C-OUT 24
FADER SIG 23
EVF OUT 22
VCC (A) 21
VIDEO OUT 20
GND (D) 19
R.V SIG 18
CS AGC 17
CLP2 16
CS-Y 15
LALT 14
CHR IN 13
N/P PULSE 12
EVF SW 25
CIN 26
4.6
2.5
2
2.1
4.8
1.9
2.9
1.2
3.1
0
0.3
3.7
C316 0.1 F
C315 0.1 F
R309 0
R310 0
CAM C OUT
CAM Y OUT(1)
CAM Y OUT(2)
BLK
TO VC-60 BOARD (4/4) (CR)
(See Page 147)
Q304 2SC4081
R329 4700
R328 470
L302 180UH 3225
C330 470P B
R330 2200
Q306 XN4601
R333 3300
R335 4700
C334 22 10V TA
R332 1800
R334 47K
R336 3900
4.8
2.8
2.2
2.6
Q304 (E-1) DELAY
Q303 (E-1) BLK SWITCH
Q309 (F-1) BUFFER
Q305 (F-27) LPF
Q306 (B-28) CLAMP
R338 27k
R339 6.8k
R337 9.1k 1/10W
C341 47P
R346 1K
0.01 B
4.8
E-2)
C mode
measured

VC-60 BOARD (2/4)
(CP,ED,EVR)

VC-60 BOARD (CP,ED,EVR)



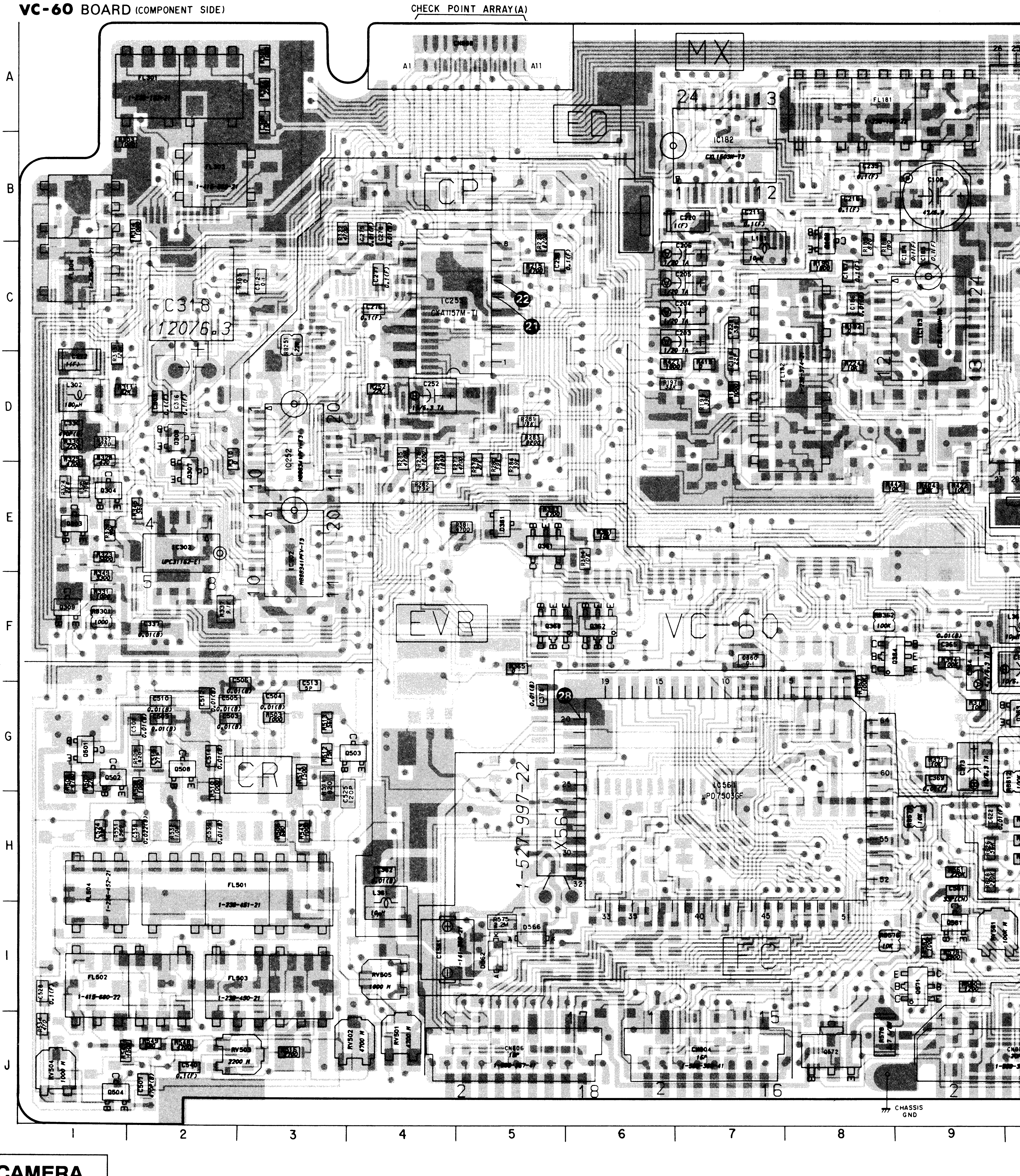
VC-60 (CAMERA) PRINTED WIRING BOARDS

— Ref. No. VC-60 BOARD: 2000 series —

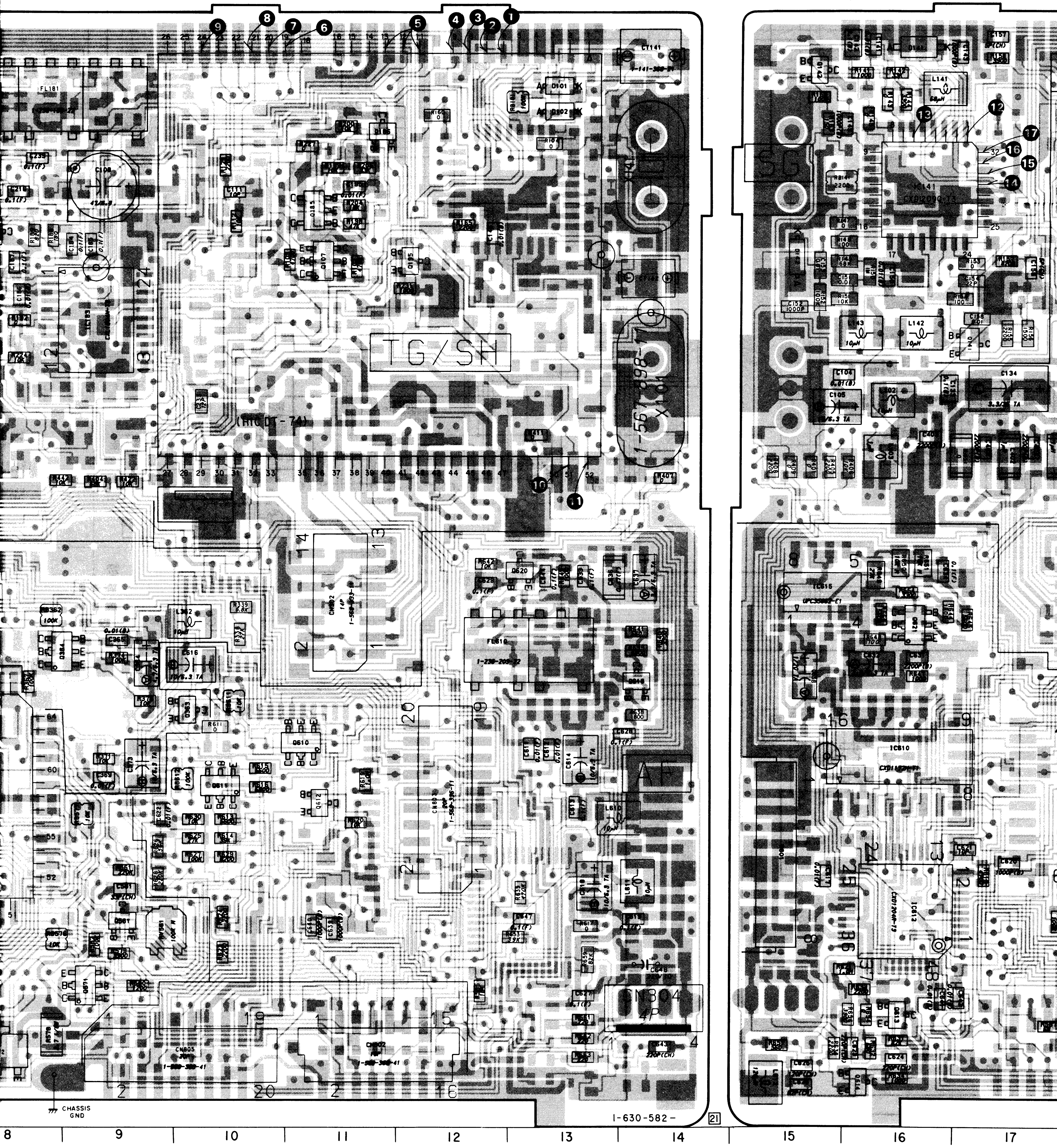
- **For printed wiring boards.**
- VC-60 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- Through hole (⊗) is omitted.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the pattern face are indicated.

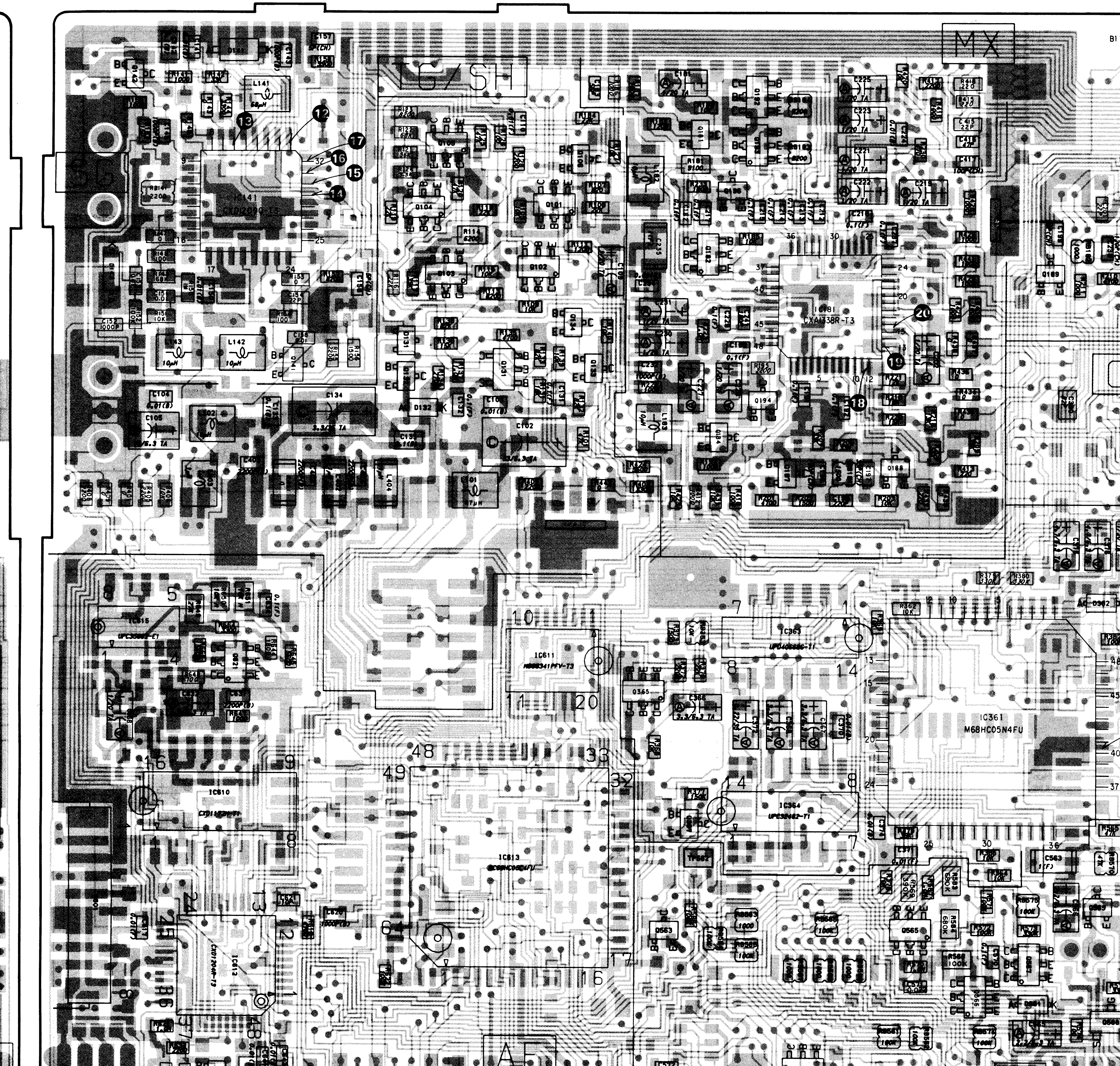
VC-60 BOARD (COMPONENT SIDE)


CHECK POINT ARRAY(A)
A1
A11
MX
CP
EVR
CR
VC-60
FC
IC252
CXA1157M-T1
IC182
IC318
12076.3
IC301
UPC3116?-E1
IC561
µPD7503GF
X561
1-527-997-22
FL501
1-230-451-21
FL502
1-415-680-22
FL503
1-230-450-21
FL504
1-230-452-21
FL181
FL182
CN806
18P
CN804
16P
RV501
RV502
RV503
RV504
RV505
RV581
CHASSIS GND
22
21
28
A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
9

VC-60 BOARD (CONDUCTOR SIDE)


TG/SH
(HIC01-74)
SG
IC141
CXD1209Q-T3
AF
CN804
4P
CN805
CN802
CN803
CN801
FL181
FL610
1-630-582-
21
CHASSIS
GND
8
9
10
11
12
13
14
15
16
17

VC-60 BOARD (CONDUCTOR SIDE)


TG/SH
MX
AF
IC141 CXD2090-T3
IC181 CXA1338R-T3
IC361 M68HC05N4FU
IC611 MB88341PFV-T3
IC363
IC364
IC613
IC610
IC612
IC615
12
13
14
15
16
17
18
19
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21
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17
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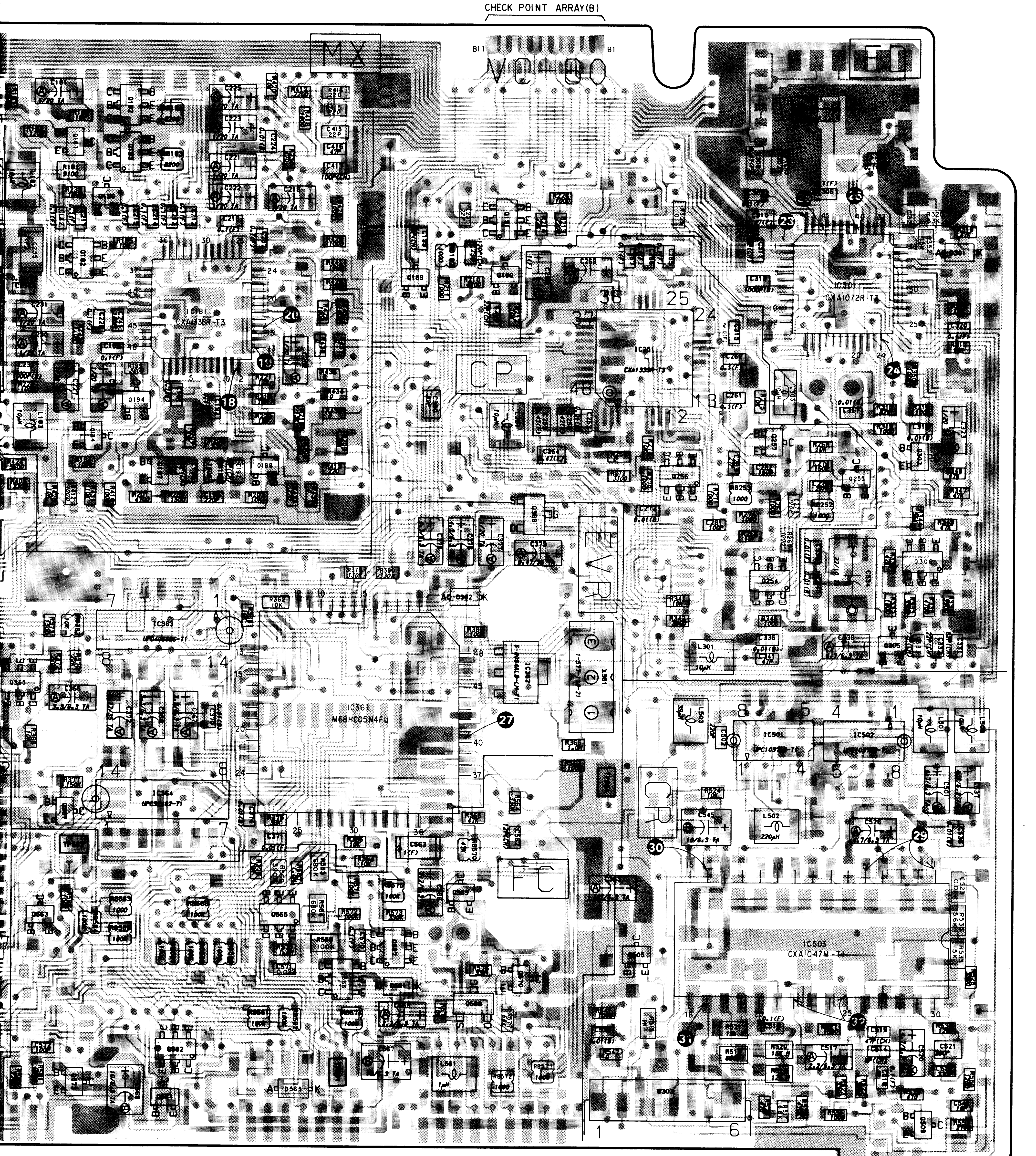
20
21
22
23


CHECK POINT ARRAY(B)
B11
B1
MX
VC-80
ED
CP
EVR
FC
CR
IC181
CXA1338R-T3
IC251
CXA1339R-T3
IC301
CXA1072R-T3
IC361
M68HC05N4FU
IC363
IC364
IC501
IC502
IC503
CXA1047M-T1
1-630-582-
21
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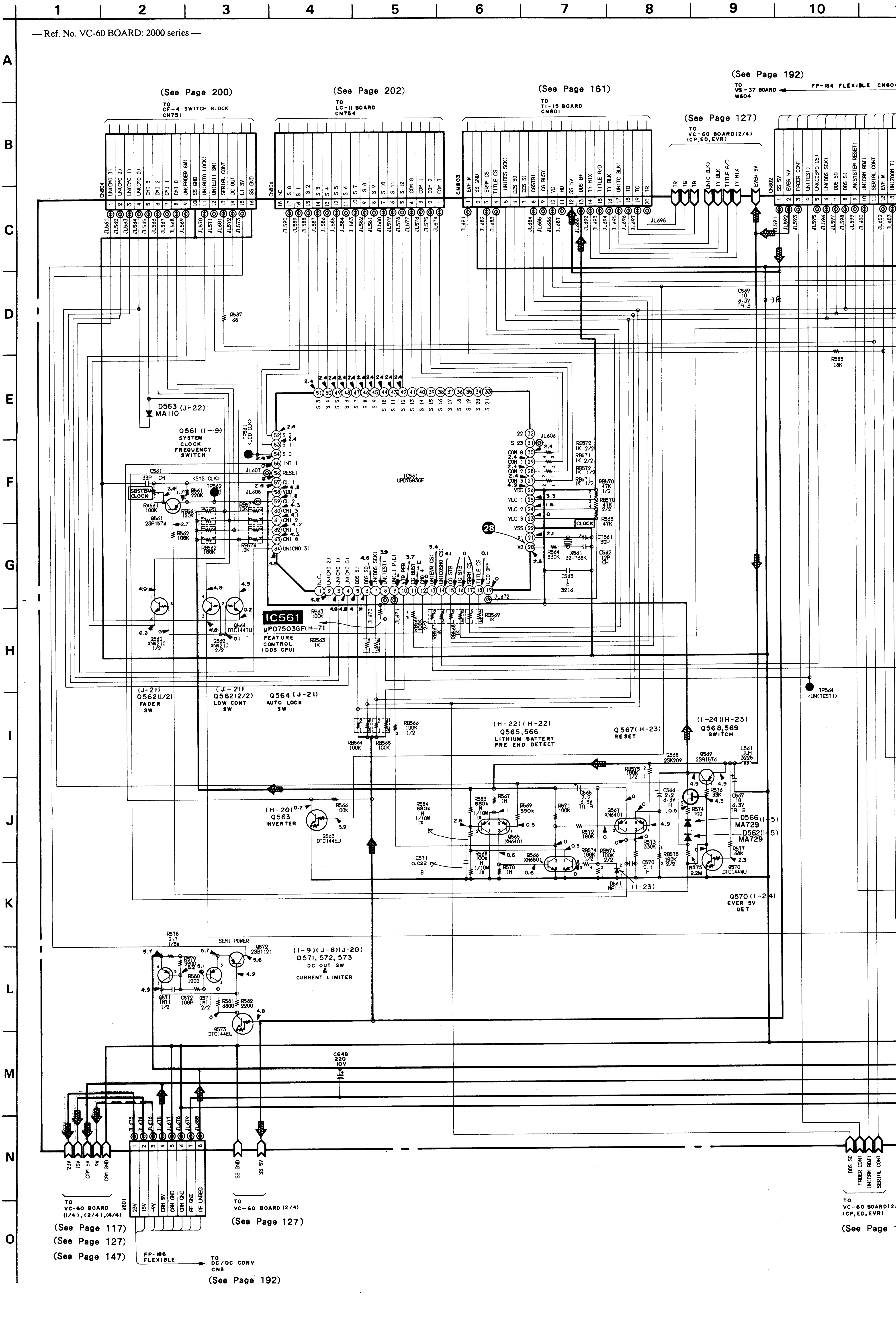
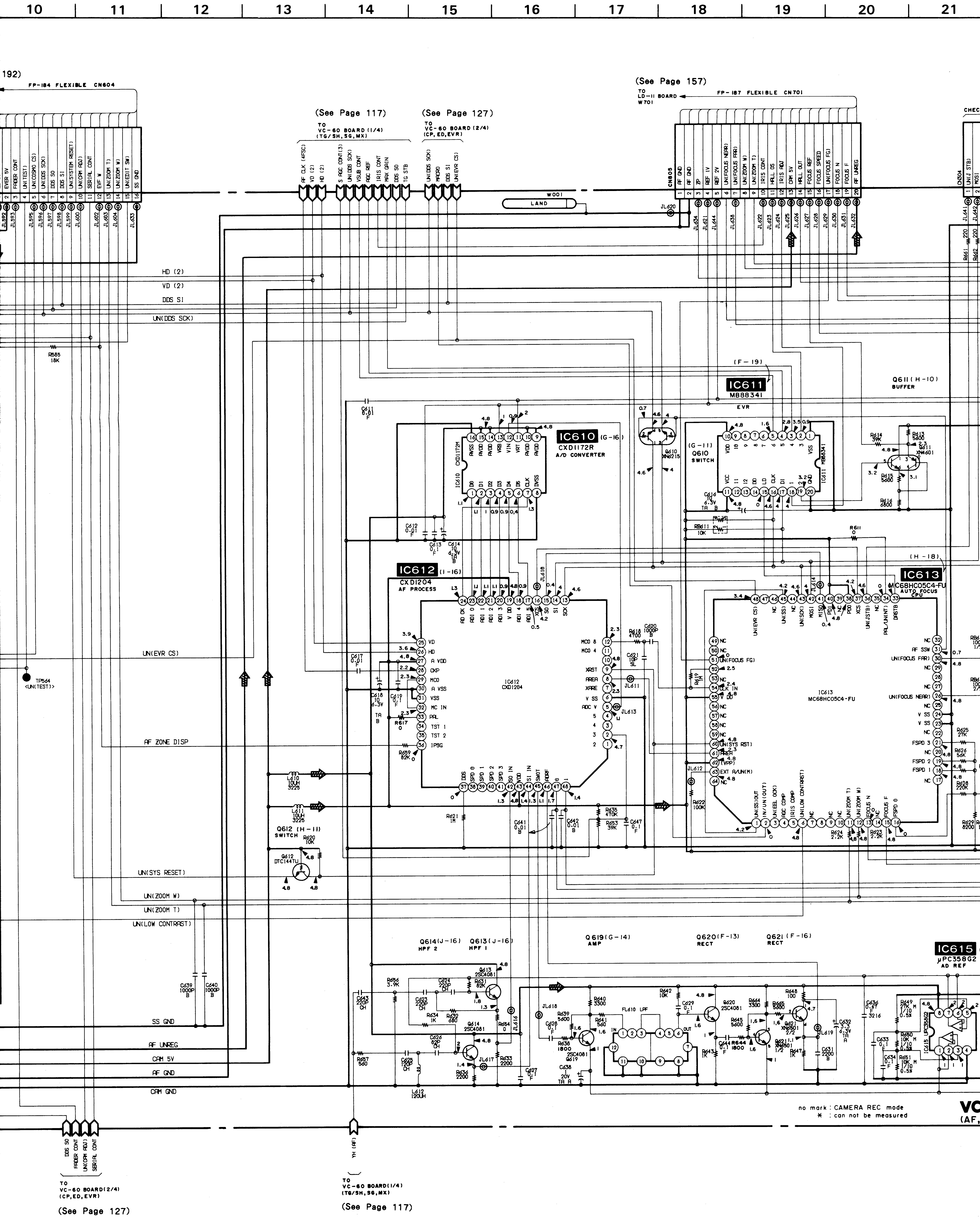
21
22
23
24
25
26
27
28

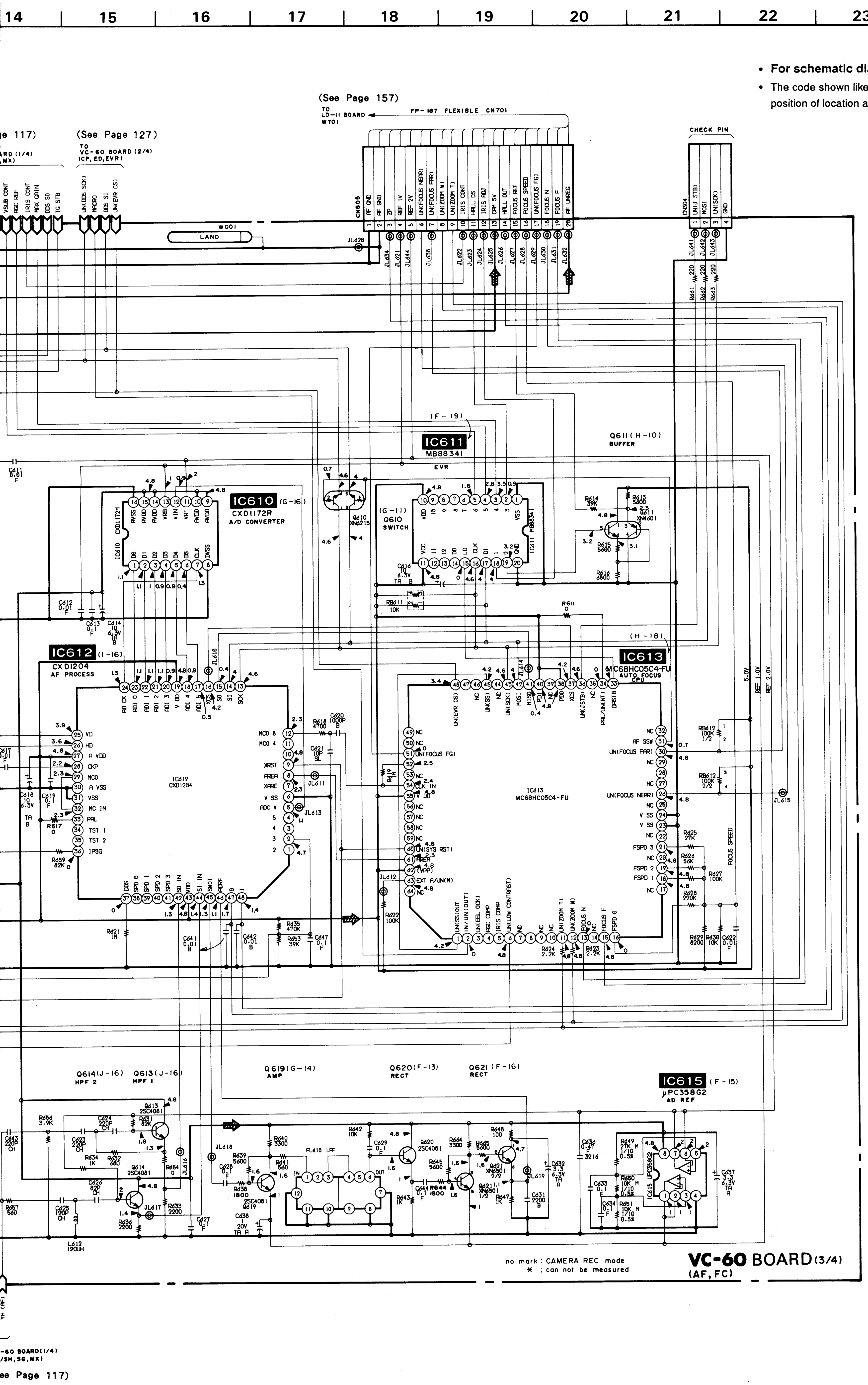
CAMERA CAMERA

— Ref. No. VC-60 BOARD: 2000 series —


1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
(See Page 200)
TO CF-4 SWITCH BLOCK CN751
CN804
UN(CMO 3)
UN(CMO 2)
UN(CMO 1)
UN(CMO 0)
CHI 3
CHI 2
CHI 1
CHI 0
UN(FADER SW)
SS GND
UN(AUTO LOCK)
UN(EDIT SW)
SERIAL CONT
DC OUT
LI 3V
SS GND
(See Page 202)
TO LC-II BOARD CN754
CN806
NC
S 0
S 1
S 2
S 3
S 4
S 5
S 6
S 7
S 8
S 9
S 10
S 11
S 12
COM 0
COM 1
COM 2
COM 3
(See Page 161)
TO TI-15 BOARD CN801
CN803
EVF W
SS GND
SRAM CS
TITLE CS
UN(DDS SCK)
DDS SO
DDS SI
COSTBI
CG BUSY
VD
HD
SS 5V
DDS B+
TY MIX
TITLE A/D
TY BLK
UN(TC BLK)
TB
TG
TR
(See Page 192)
TO VS-37 BOARD W604
FP-184 FLEXIBLE CN604
(See Page 127)
TO VC-60 BOARD(2/4) (CP,ED,EVR)
TR
TG
TB
UN(C BLK)
TY BLK
TITLE A/D
TY MIX
EVER 5V
CN802
SS 5V
EVER 5V
FADER CONT
UN(TEST)
UN(COSMO CS)
UN(DDS SCK)
DDS SO
DDS SI
UN(SYSTEM RESET)
UN(CRM ADJ)
SERIAL CONT
EVF W
UN(ZOOM T)
JL698
C569 10 6.3V TA B
R585 18K
R587 68
D563 (J-22) MA110
Q561 (I-9) SYSTEM CLOCK FREQUENCY SWITCH
C561 33P CH
<SYS CLK>
TP562
SBSTEM CLOCK
R561 220K
RV561 100K
Q561 2SA1576
R562 100K
RB562 100K
RB576 10K
TP561 <LCD CLK>
JL607
JL608
S 2
S 1
S 0
INT 1
RESET
CL 1
VDD
CL 2
CHI 3
CHI 2
CHI 1
CHI 0
UN(CMO 3)
IC561 UPD7503GF
22
S 23
COM 0
COM 1
COM 2
COM 3
VDD
VLC 1
VLC 2
VLC 3
VSS
X1
X2
JL606
RB572 1K 2/2
RB571 1K 2/2
RB570 47K 1/2
RB570 47K 2/2
R565 47K
CLOCK
CT561 30P
R564 330K
X561 32.768K
C562 12P CH
C563 3216
28
N.C.
UN(CMO 2)
UN(CMO 1)
UN(CMO 0)
DDS SI
DDS SO
UN(DDS SCK)
UN(TEST)
UN(LI P.E)
TR PER
CG BUSY
UN(EVR CS)
UN(COSMO CS)
CG STB
TG STB
SRAM CS
TITLE CS
LCD OFF
JL672
JL670
JL671
IC561
μPD7503GF(H-7)
FEATURE CONTROL (DDS CPU)
R563 100K
RB563 1K
RB569 1K
Q562 XN4210 1/2
Q562 XN4210 2/2
Q564 DTC144TU
(J-21) Q562(1/2) FADER SW
(J-21) Q562(2/2) LOW CONT SW
Q564 (J-21) AUTO LOCK SW
RB566 100K 1/2
RB564 100K
RB565 100K
TP564 <UN(TEST)>
(H-22)(H-22) Q565,566 LITHIUM BATTERY PRE END DETECT
Q567(H-23) RESET
(I-24)(H-23) Q568,569 SWITCH
Q568 2SK209
Q569 2SA1576
L561 10μH 3225
RB575 100K 1/2
R576 33K
C567 10 6.3V TA B
R574 100
D566(I-5) MA729
D562(I-5) MA729
R577 68K
R575 2.2M
Q570 DTC144WU
Q570 (I-24) EVER 5V DET
(H-20) Q563 INVERTER
R566 100K
Q563 DTC144EU
R584 680k 1/10W 1%
R583 680k 1/10W 1%
R567 1M
R569 390k
R571 100K
C565 2.2 6.3V TA A
C566 2.2 6.3V A
Q567 XN4401
Q565 XN6401
R572 100K
R573 330K
R568 100k 1/10W 1%
R570 1M
Q566 XN6501 1/2
RB574 100K 2/2
RB575 100K 2/2
C570 0.1 F
D561 MA111
(I-23)
C571 0.022 B
R578 2.7 1/8W
SEMI POWER
Q572 2SB1121
R579 3900
R580 1200
Q571 IMT1 1/2
C572 100P
Q571 IMT1 2/2
R581 6800
R582 2200
Q573 DTC144EU
(I-9)(J-8)(J-20) Q571, 572, 573 DC OUT SW & CURRENT LIMITER
C648 220 10V
JL673
JL674
JL675
JL677
JL678
JL679
JL680
W801
23V
15V
CRM 5V
-9V
CRM GND
CRM 8V
CRM GND
RF GND
RF UNREG
SS GND
SS 5V
TO VC-60 BOARD (1/4),(2/4),(4/4)
(See Page 117)
(See Page 127)
(See Page 147)
TO VC-60 BOARD (2/4)
(See Page 127)
FP-186 FLEXIBLE
TO DC/DC CONV CN3
(See Page 192)
DDS SO
FADER CONT
UN(CRM ADJ)
SERIAL CONT
TO VC-60 BOARD(2/4) (CP,ED,EVR)
(See Page


10
11
12
13
14
15
16
17
18
19
20
21
192)
FP-184 FLEXIBLE CN604
(See Page 117)
TO VC-60 BOARD (1/4) (TG/SH,SG,MX)
(See Page 127)
TO VC-60 BOARD (2/4) (CP,ED,EVR)
(See Page 157)
TO LD-11 BOARD W701
FP-187 FLEXIBLE CN701
CN805
W001
LAND
JL620
HD (2)
VD (2)
DDS SI
UN(DDS SCK)
R585 18K
(F-19)
IC611
MB88341
EVR
Q611 (H-10)
BUFFER
C611 0.01 F
IC610 (G-16)
CXD1172R
A/D CONVERTER
Q610 XN6215
(G-11) Q610 SWITCH
C616 10 6.3V TA B
R611 10K
C612 0.01 F
C613 0.1 F
C614 10 6.3V TA B
IC612 (I-16)
CXD1204
AF PROCESS
JL618
(H-18)
IC613
MC68HC05C4-FU
AUTO FOCUS CPU
IC612 CXD1204
IC613 MC68HC05C4-FU
UN(EVR CS)
TP564 <UN(TEST)>
AF ZONE DISP
C617 0.01 F
C618 10 6.3V TA B
C619 0.1 F
R617 0
R659 82K
R418 4700
C620 1000P B
C621 10P SL
JL611
JL613
JL612
R622 100K
L610 10UH 3225
L611 10UH 3225
R621 1M
C641 0.01 B
C642 0.01 B
R635 470K
R653 39K
C647 0.1 F
Q612 (H-11) SWITCH
Q612 DTC144TU
R620 10K
UN(SYS RESET)
UN(ZOOM W)
UN(ZOOM T)
UN(LOW CONTRAST)
C639 1000P B
C640 1000P B
SS GND
AF UNREG
CAM 5V
AF GND
CAM GND
Q614 (J-16) HPF 2
Q613 (J-16) HPF 1
Q619 (G-14) AMP
Q620 (F-13) RECT
Q621 (F-16) RECT
IC615
μPC358G2
AD REF
Q613 2SC4081
Q614 2SC4081
Q619 2SC4081
Q620 2SC4081
Q621 XN6501
FL610 LPF
JL616
JL617
JL619
L612 120UH
C638 1 20V TA A
no mark : CAMERA REC mode
* : can not be measured
VC
(AF,
DDS SO
FADER CONT
UN(CAM ADJ)
SERIAL CONT
YH (AF)
TO VC-60 BOARD (2/4) (CP,ED,EVR)
(See Page 127)
TO VC-60 BOARD (1/4) (TG/SH,SG,MX)
(See Page 117)

- **For schematic diagrams.**
- The code shown like (C-9) for each semiconductor indicates the position of location address on the printed wiring board.

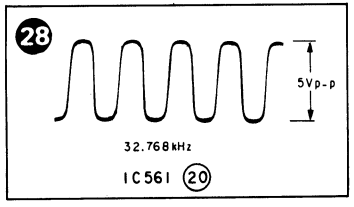


14 15 16 17 18 19 20 21 22 23 24 25
(See Page 157)
TO LD-11 BOARD W701
FP-187 FLEXIBLE CN701
(See Page 127)
TO VC-60 BOARD (2/4) (CP, ED, EVR)
CHECK PIN
CN805
AF GND
ZP
REF 1V
REF 2V
UN(FOCUS NEAR)
UN(FOCUS FAR)
UN(ZOOM W)
UN(ZOOM T)
IRIS CONT
HALL OS
IRIS ADJ
CPM 5V
HALL OUT
FOCUS REF
FOCUS SPEED
UN(FOCUS FG)
FOCUS N
FOCUS F
AF UNREG
CN504
UN(J STB)
MOSI
UN(SCK)
GND
W001
LAND
IC610 (G-16)
CXD1172R
A/D CONVERTER
IC611 (F-19)
MB88341
EVR
Q610 (G-11)
Q610 SWITCH
Q611 (H-10)
BUFFER
IC612 (I-16)
CXD1204
AF PROCESS
IC613 (H-18)
MC68HC05C4-FU
AUTO FOCUS CPU
Q614 (J-16)
HPF 2
Q613 (J-16)
HPF 1
Q619 (G-14)
AMP
Q620 (F-13)
RECT
Q621 (F-16)
RECT
IC615 (F-15)
μPC358G2
AD REF
FL610 LPF
JL615
JL617
JL618
JL619
5.0V
REF 1.0V
REF 2.0V
FOCUS SPEED
-60 BOARD(1/4)
/SH, SG, MX)
ee Page 117)

no mark : CAMERA REC mode
＊ : can not be measured

VC-60 BOARD(3/4)
(AF, FC)

VC-60 BOARD (AF, FC)



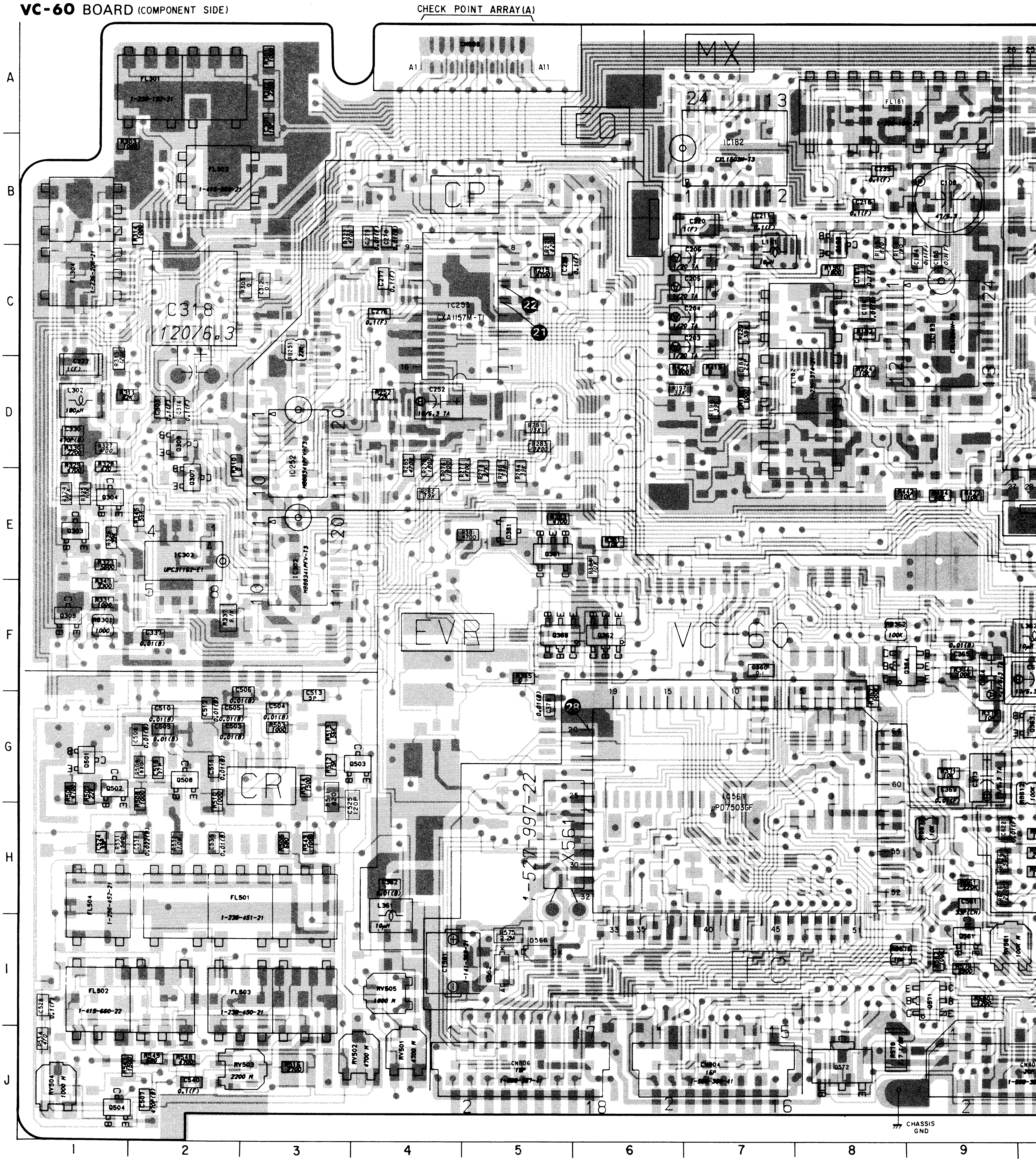
VC-60 (CAMERA) PRINTED WIRING BOARDS

— Ref. No. VC-60 BOARD: 2000 series —

- **For printed wiring boards.**
- VC-60 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- Through hole (⊗) is omitted.

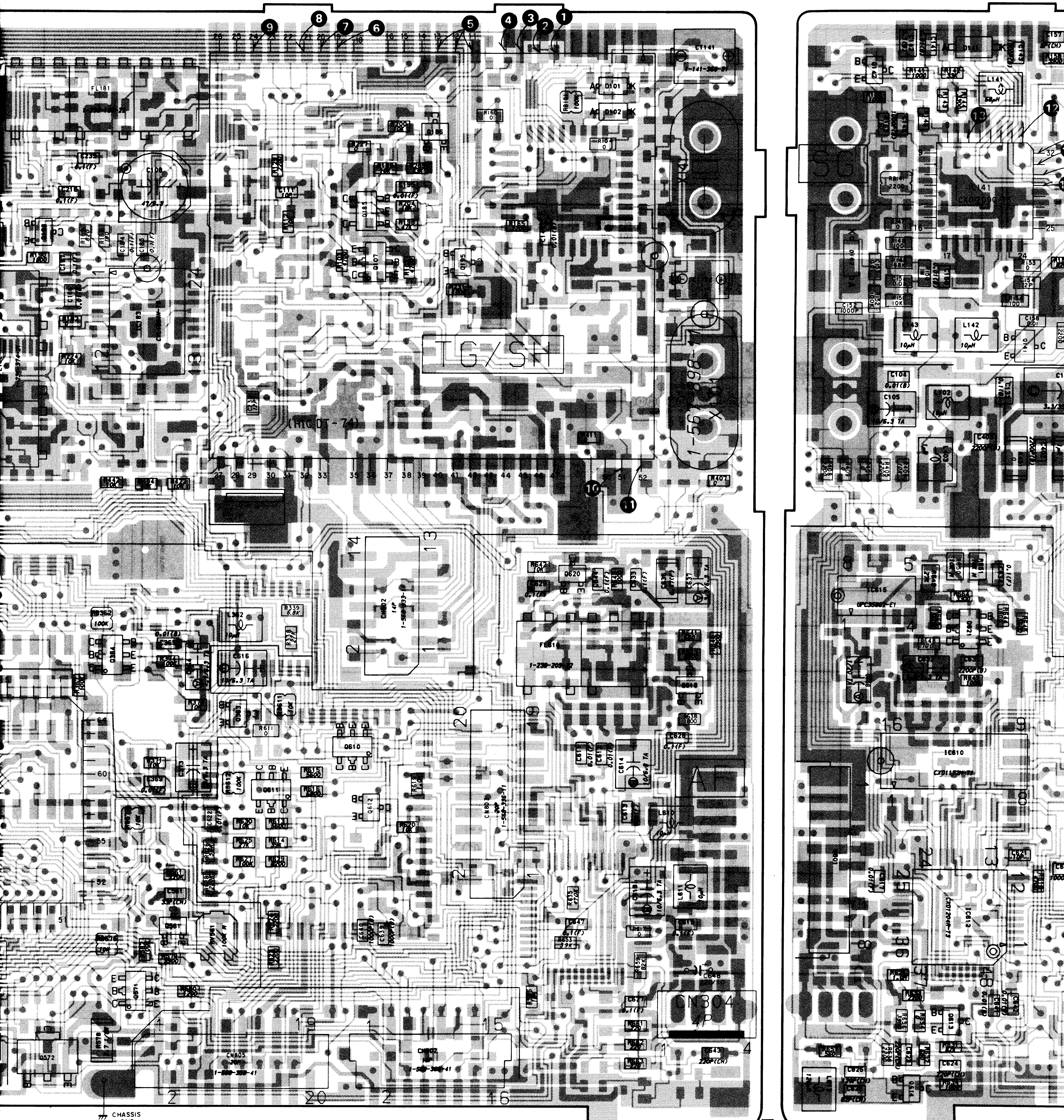
Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the pattern face are indicated.

VC-60 BOARD (COMPONENT SIDE)



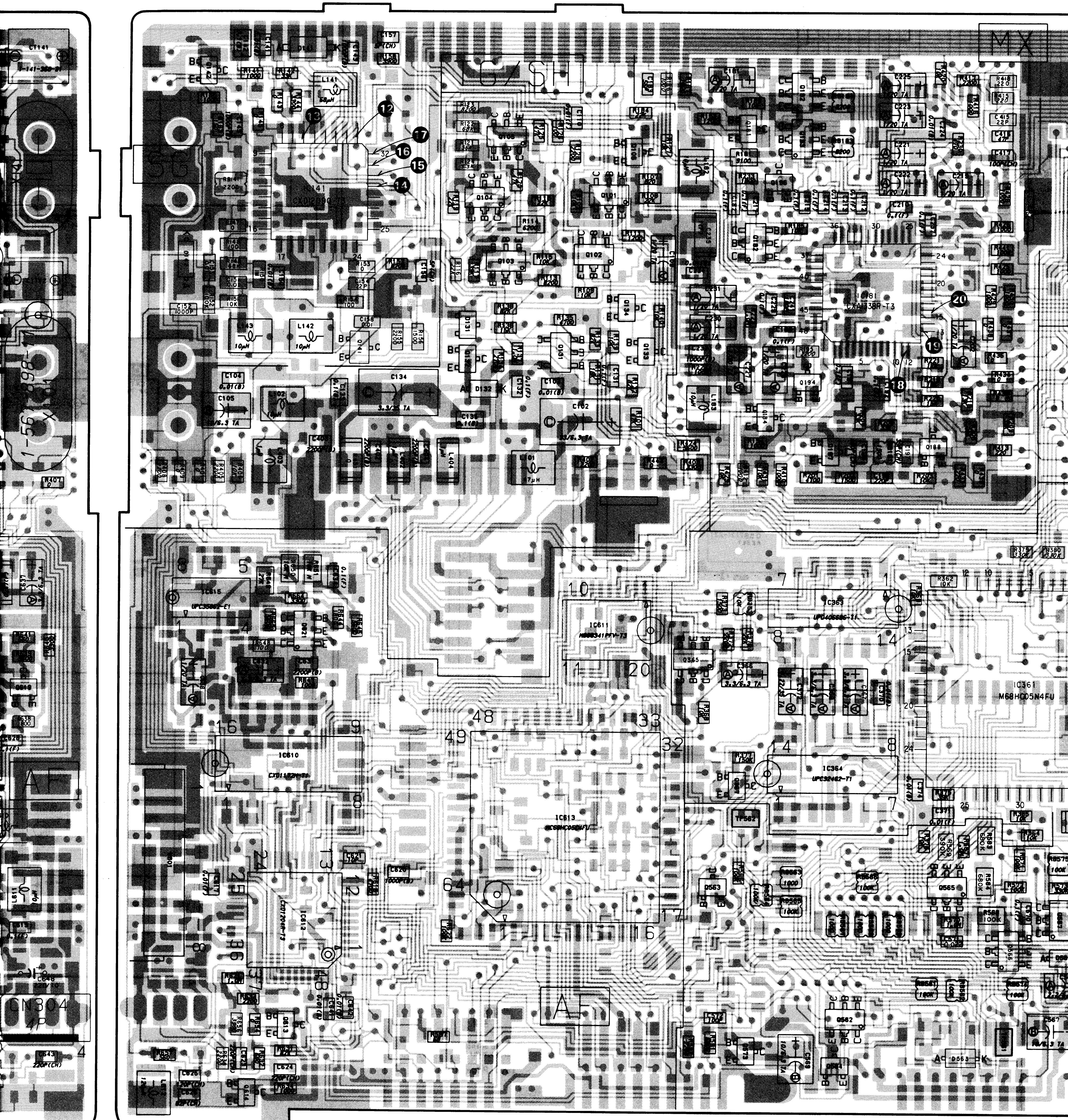
CHECK POINT ARRAY (A)
A1
A11
MX
CP
EVR
CR
VC-60
FC
FL301
FL302
FL304
FL181
C318 120/6.3
IC182 CXL1503M-T3
IC252 CXA1157M-T1
IC292
IC302
IC303 UPC3112-E1
IC561 μPD7503GF
X561 1-527-997-22
C108
L302 180μH
FL501 1-236-451-21
FL502 1-415-660-22
FL503 1-236-450-21
FL504 1-236-452-21
RV501
RV502 4700 H
RV503 2200 H
RV504 1000 H
RV505 1000 H
CN806 18P
CN804 16P
21
22
28
CHASSIS GND
A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
9

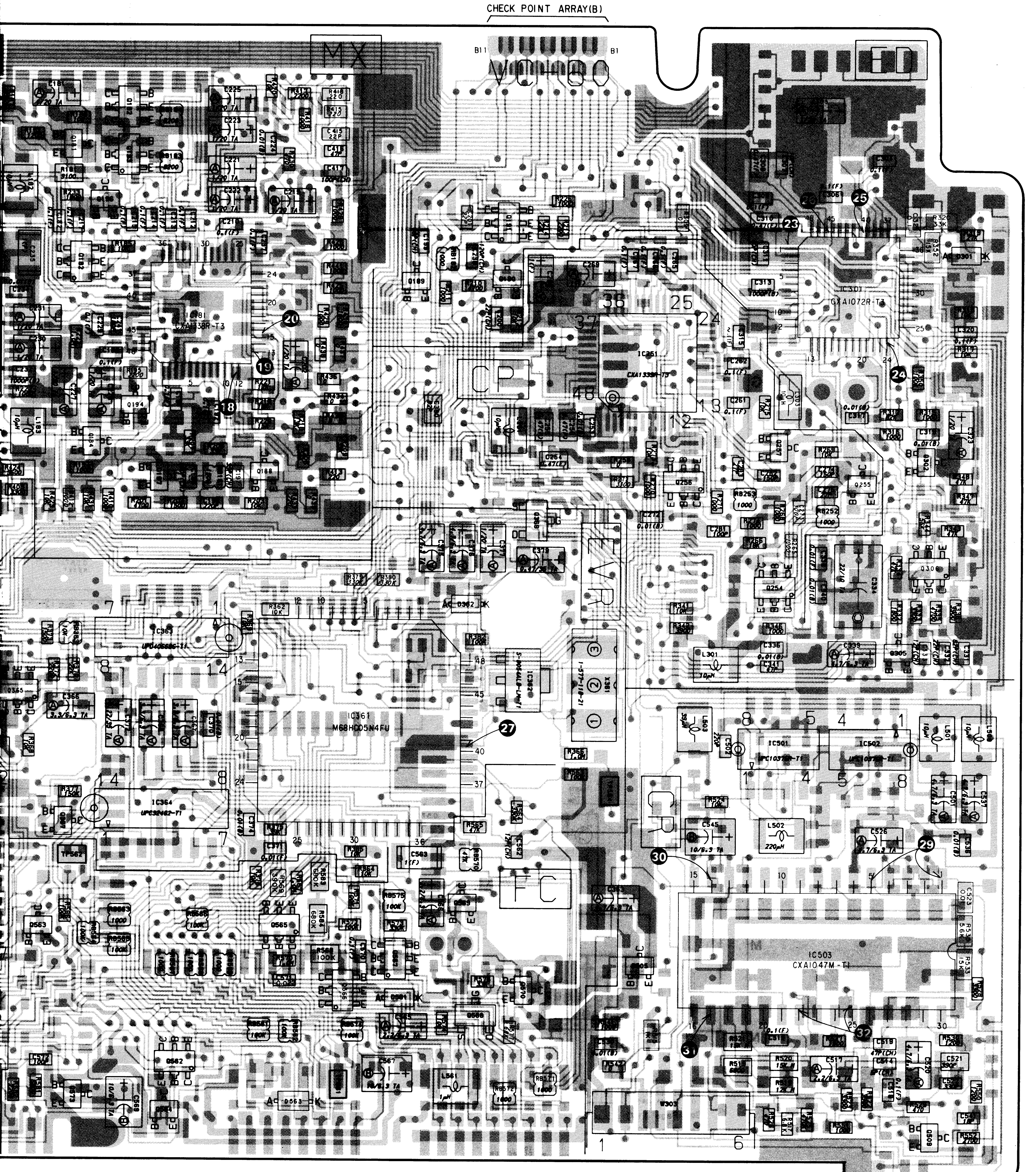
VC-60 BOARD (CONDUCTOR SIDE)


TG/SH
SG
AF
CN304
4P
(HIC DT-74)
FL181
C100
IC141
CX20209
L141
L142
L143
C104
C105
CT141
X101
Q101
D101
D102
IC615
IC610
IC612
CN802
CN803
CN805
FL610
Q610
Q611
Q612
Q620
Q384
Q561
Q571
Q572
L362
L610
L611
CHASSIS GND
1-630-582-
21
8
9
10
11
12
13
14
15
16

CAMERA **CAMERA**

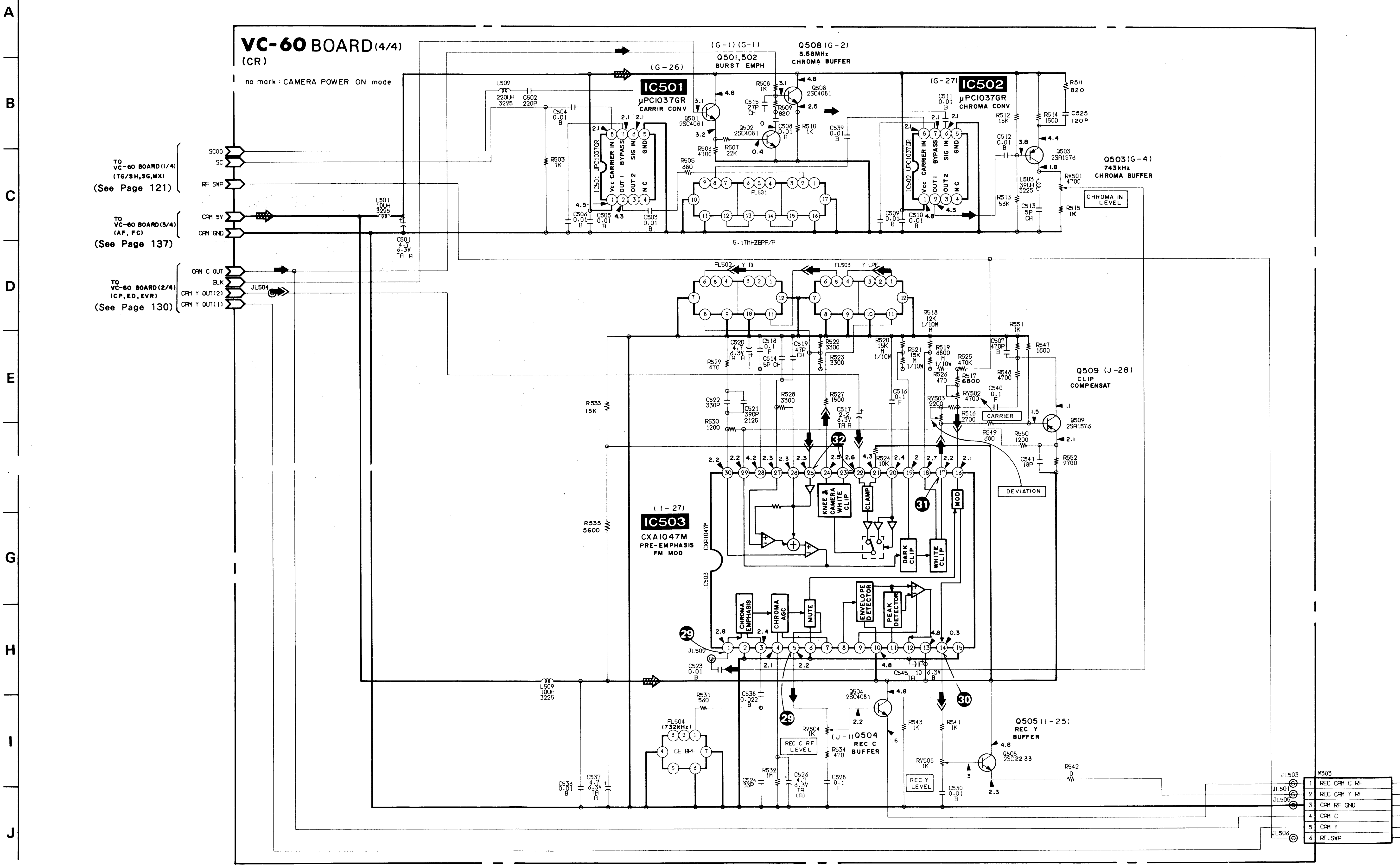
VC-60 BOARD (CONDUCTOR SIDE)

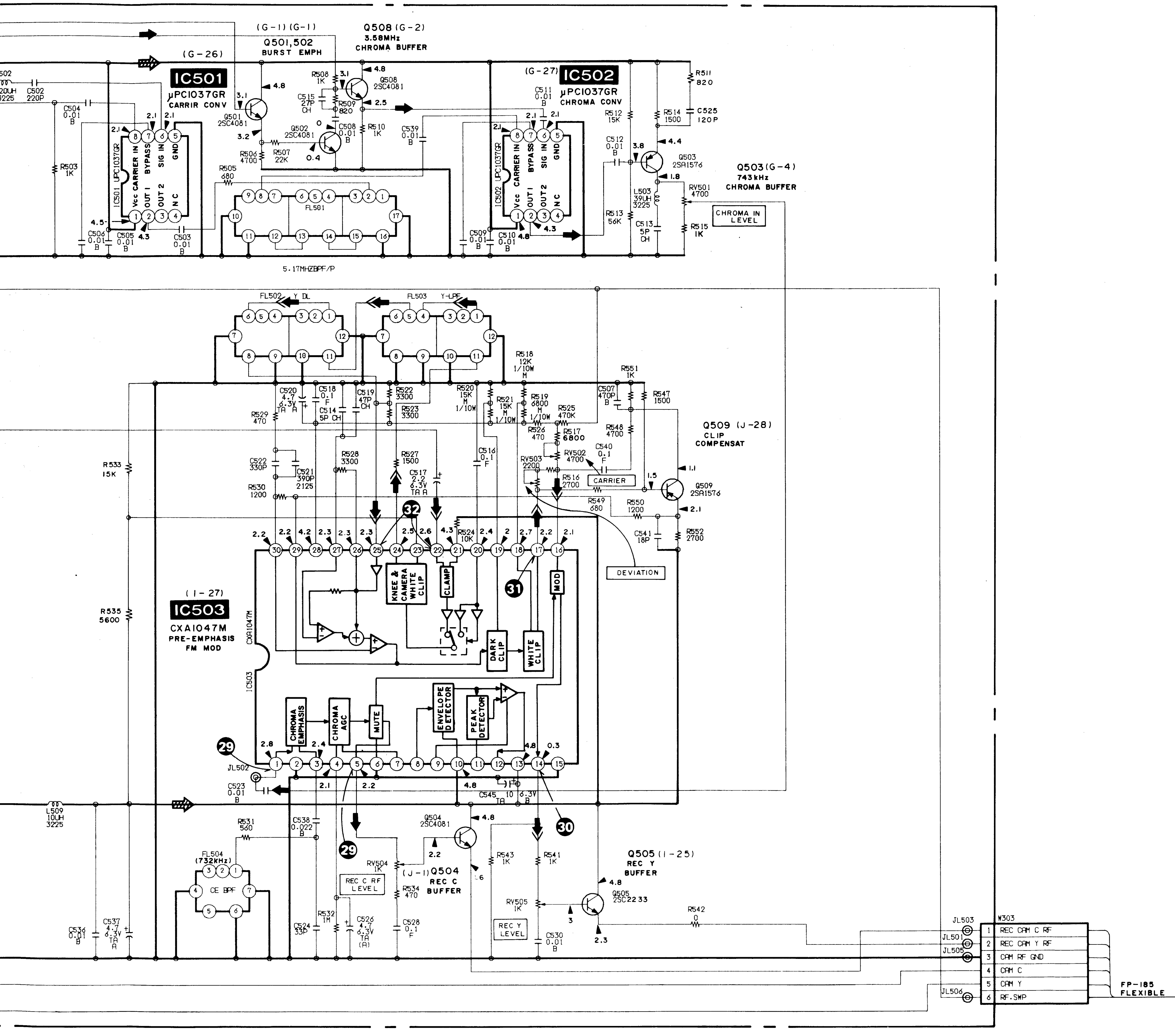

MX
G/SH
AF
IC141
IC181
CXA1130R-T3
IC611
IC361
M68HC05N4FU
IC363
IC364
IC610
IC613
IC612
IC615
CN304
4P
1-630-582-
21
14
15
16
17
18
19
20
21
22


CHECK POINT ARRAY(B)
B11
B1
MX
CP
ED
EVR
FC
IC181
CXA1138R-T3
IC251
CXA1339R-T3
IC301
CXA1072R-T3
IC361
M68HC05N4FU
IC362
IC363
IC364
IC501
IC502
IC503
CXA1047M-T1
X361
L301
L502
W303
18
19
20
23
24
25
26
27
29
30
31
32
1-630-582-
21
20
21
22
23
24
25
26
27
28

CAMERA **CAMERA**

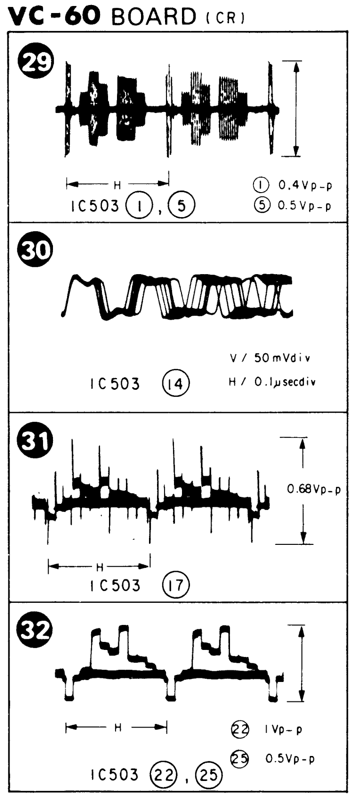
— Ref. No. VC-60 BOARD: 2000 series —


A
B
C
D
E
G
H
I
J
VC-60 BOARD(4/4)
(CR)
no mark : CAMERA POWER ON mode
TO VC-60 BOARD(1/4) (TG/SH,SG,MX)
(See Page 121)
SCOO
SC
RF SWP
TO VC-60 BOARD(3/4) (AF, FC)
(See Page 137)
CAM 5V
CAM GND
TO VC-60 BOARD(2/4) (CP,ED,EVR)
(See Page 130)
CAM C OUT
BLK
CAM Y OUT(2)
CAM Y OUT(1)
JL504
L501 10UH 3225
C501 4.7 6.3V TA A
L502 220UH 3225
C502 220P
C504 0.01 B
R503 1K
(G-26)
IC501
µPC1037GR
CARRIR CONV
Vcc CARRIER IN BYPASS SIG IN GND
OUT 1 OUT 2 NC
C506 0.01 B
C505 0.01 B
C503 0.01 B
(G-1) (G-1)
Q501,502
BURST EMPH
Q501 2SC4081
Q502 2SC4081
R505 680
R506 4700
R507 22K
C515 27P CH
R508 1K
R509 820
C508 0.01 B
R510 1K
Q508 (G-2)
3.58MHz
CHROMA BUFFER
Q508 2SC4081
C539 0.01 B
FL501
5.17MHZBPF/P
(G-27)
IC502
µPC1037GR
CHROMA CONV
C511 0.01 B
C509 0.01 B
C510 0.01 B
R512 15K
R513 56K
C512 0.01 B
R511 820
R514 1500
C525 120P
Q503 2SA1576
L503 39UH 3225
C513 5P CH
RV501 4700
R515 1K
Q503 (G-4)
743kHz
CHROMA BUFFER
CHROMA IN LEVEL
FL502 Y DL
FL503 Y-LPF
R518 12K 1/10W M
R551 1K
C507 470P B
R547 1500
R548 4700
C520 4.7 6.3V TA A
C518 0.1 F
C514 5P CH
C519 47P CH
R522 3300
R523 3300
R520 15K M 1/10W
R521 15K M 1/10W
R519 6800 M 1/10W
R525 470K
R526 470
R517 6800
R529 470
C522 330P
C521 390P 2125
R528 3300
R527 1500
C517 2.2 6.3V TA A
C516 0.1 F
RV503 2200
RV502 4700
C540 0.1 F
CARRIER
R516 2700
R549 680
R550 1200
C541 18P
R552 2700
Q509 (J-28)
CLIP COMPENSAT
Q509 2SA1576
DEVIATION
R530 1200
R533 15K
R535 5600
R524 10K
32
31
(I-27)
IC503
CXA1047M
PRE-EMPHASIS FM MOD
KNEE & CAMERA WHITE CLIP
CLAMP
MOD
DARK CLIP
WHITE CLIP
CHROMA EMPHASIS
CHROMA AGC
MUTE
ENVELOPE DETECTOR
PEAK DETECTOR
29
JL502
C523 0.01 B
C545 10 6.3V TA B
30
L509 10UH 3225
R531 560
C538 0.022 B
FL504 (732kHz)
CE BPF
C534 0.01 B
C537 4.7 6.3V TA A
C524 33P
R532 1M
C526 4.7 6.3V TA (A)
C528 0.1 F
Q504 2SC4081
RV504 1K
REC C RF LEVEL
R534 470
(J-1) Q504
REC C BUFFER
R543 1K
R541 1K
RV505 1K
REC Y LEVEL
C530 0.01 B
Q505 (I-25)
REC Y BUFFER
Q505 2SC2233
R542 0
JL503
JL501
JL505
JL506
W303
1 REC CAM C RF
2 REC CAM Y RF
3 CAM RF GND
4 CAM C
5 CAM Y
6 RF.SWP


(G-1) (G-1)
Q501,502
BURST EMPH
Q508 (G-2)
3.58MHz
CHROMA BUFFER
(G-26)
IC501
μPC1037GR
CARRIR CONV
(G-27)
IC502
μPC1037GR
CHROMA CONV
Q503 (G-4)
743kHz
CHROMA BUFFER
CHROMA IN LEVEL
FL501
5.17MHZ BPF/P
FL502 Y DL
FL503 Y-LPF
Q509 (J-28)
CLIP COMPENSAT
CARRIER
DEVIATION
(I-27)
IC503
CXA1047M
PRE-EMPHASIS FM MOD
KNEE & CAMERA WHITE CLIP
CLAMP
DARK CLIP
WHITE CLIP
MOD
CHROMA EMPHASIS
CHROMA AGC
MUTE
ENVELOPE DETECTOR
PEAK DETECTOR
FL504 (732kHz)
CE BPF
(J-1) Q504
REC C BUFFER
REC C RF LEVEL
Q505 (I-25)
REC Y BUFFER
REC Y LEVEL
JL502
JL503
JL501
JL505
JL506
W303
1 REC CAM C RF
2 REC CAM Y RF
3 CAM RF GND
4 CAM C
5 CAM Y
6 RF.SWP
FP-185 FLEXIBLE

TO VS-37 BOARD (See Page 179)
CN202

VC-60 BOARD (CR)



- **For schematic diagrams.**
- The code shown like (C-9) for each semiconductor indicates the position of location address on the printed wiring board.

- Signal path

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC	➡	⇨		
PB				

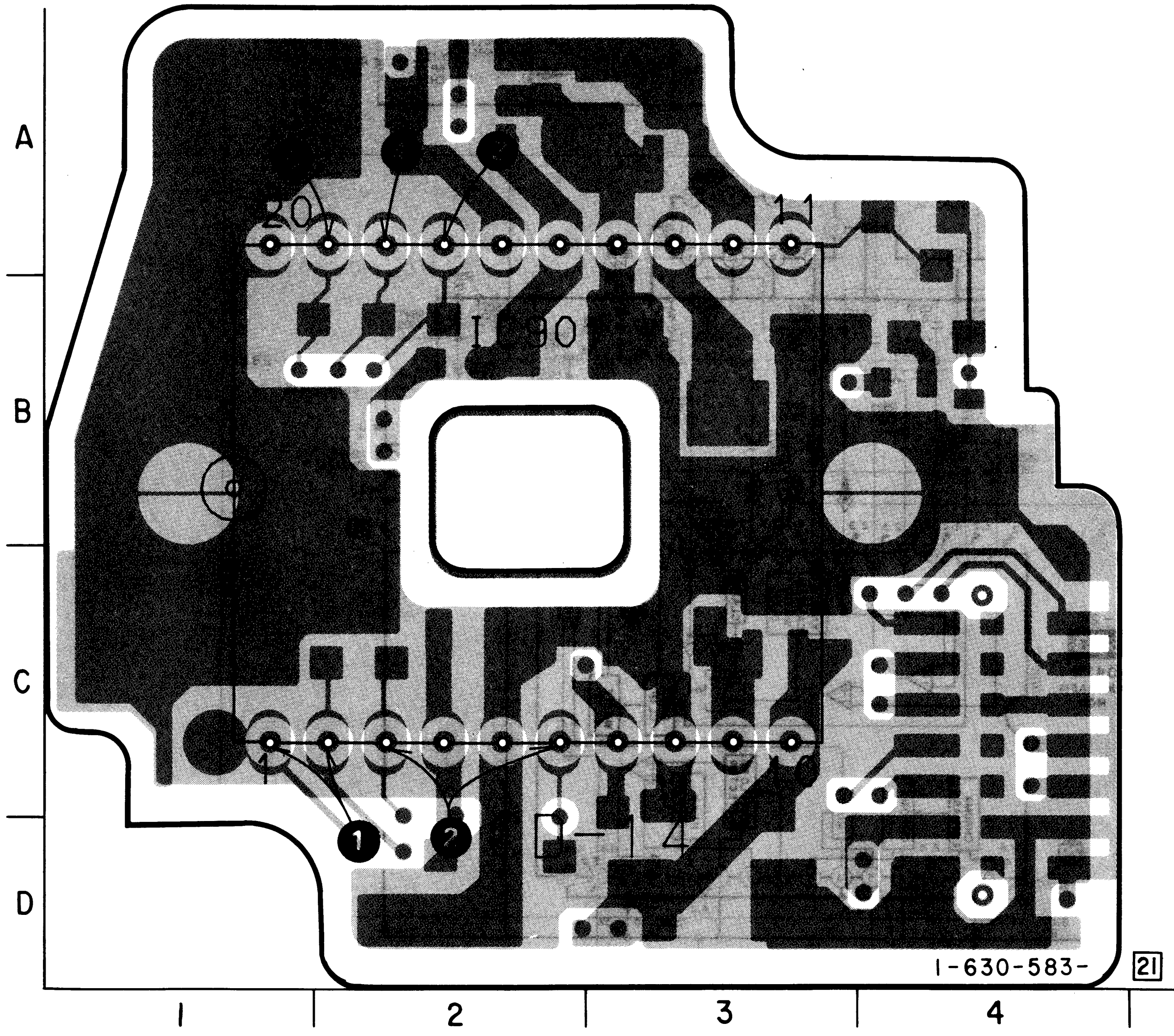
CD-14 (CCD IMAGER) PRINTED WIRING BOARDS

— Ref. No. CD-14 BOARD: 1000 series —

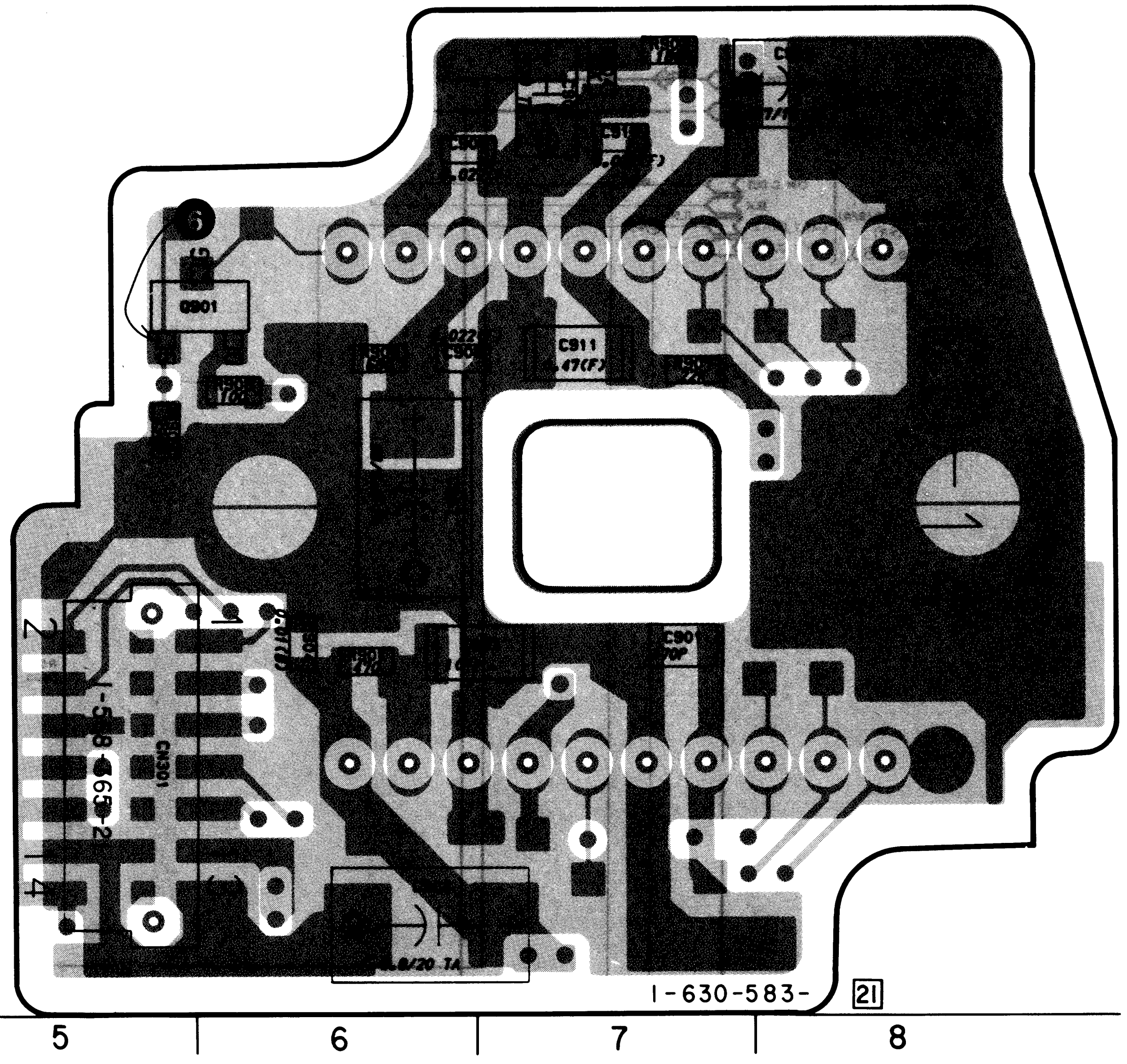
- **For printed wiring boards.**
- CD-14 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- Through hole (⊗) is omitted.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the pattern face are indicated.

CD-14 BOARD (COMPONENT SIDE)


A
B
C
D
20
11
1
2
1
2
3
4
1-630-583- 21

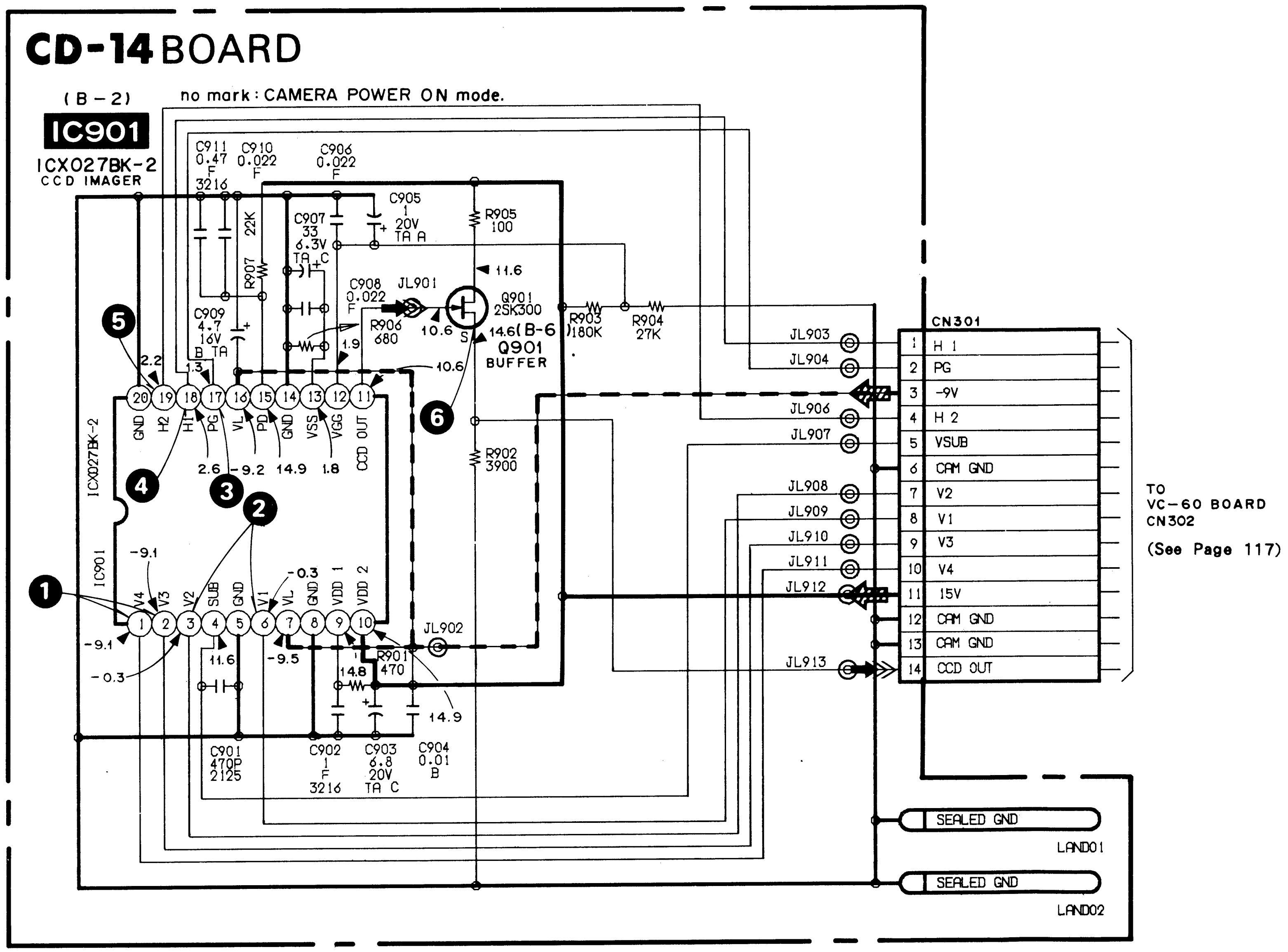
CD-14 BOARD (CONDUCTOR SIDE)


6
Q901
C911
.47(F)
CN301
1-568-565-2
5
6
7
8
1-630-583- 21

CD-14 (CCD IMAGER) SCHEMATIC DIAGRAMS

— Ref. No. CD-14 BOARD: 1000 series —

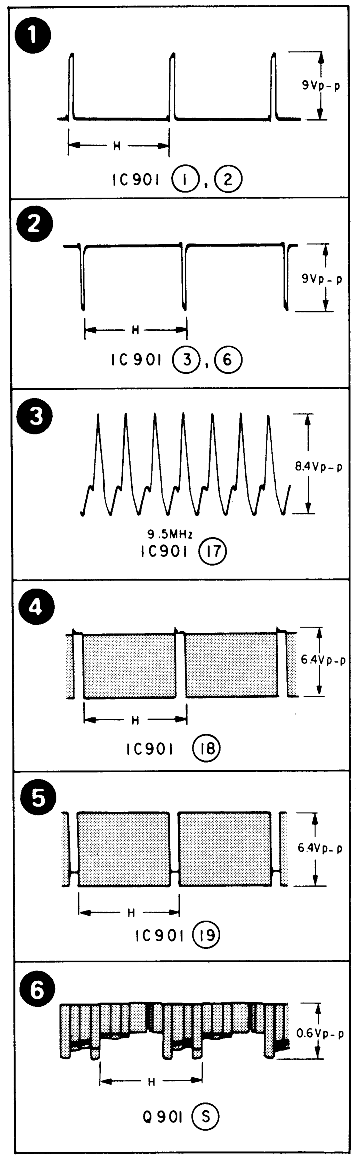
- **For schematic diagrams.**
- The code shown like (C-9) for each semiconductor indicates the position of location address on the printed wiring board.


CD-14 BOARD
(B-2)
IC901
ICX027BK-2
CCD IMAGER
no mark : CAMERA POWER ON mode.
C911 0.47 F 3216
C910 0.022 F
C906 0.022 F
C905 1 20V TA A
C907 33 6.3V TA C
R907 22K
R905 100
C908 0.022 F
JL901
Q901 2SK300
Q901 BUFFER
14.6(B-6)
R903 180K
R904 27K
C909 4.7 16V B TA
R906 680
11.6
10.6
1.9
2.2
1.3
20 GND
19 H2
18 H1
17 PG
16 VL
15 PD
14 GND
13 VSS
12 VGG
11 CCD OUT
2.6
-9.2
14.9
1.8
ICX027BK-2
IC901
R902 3900
-9.1
-0.3
1 V4
2 V3
3 V2
4 SUB
5 GND
6 V1
7 VL
8 GND
9 VDD 1
10 VDD 2
-9.5
R901 470
14.8
JL902
C901 470P 2125
C902 1 F 3216
C903 6.8 20V TA C
C904 0.01 B
JL903
JL904
JL906
JL907
JL908
JL909
JL910
JL911
JL912
JL913
CN301
1 H 1
2 PG
3 -9V
4 H 2
5 VSUB
6 CAM GND
7 V2
8 V1
9 V3
10 V4
11 15V
12 CAM GND
13 CAM GND
14 CCD OUT
SEALED GND
LAND01
SEALED GND
LAND02
TO VC-60 BOARD CN302
(See Page 117)

- Signal path

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC			➡	
PB				

CD-14 BOARD


❶
9Vp-p
H
IC901 ①, ②
❷
9Vp-p
H
IC901 ③, ⑥
❸
8.4Vp-p
9.5MHz
IC901 ⑰
❹
6.4Vp-p
H
IC901 ⑱
❺
6.4Vp-p
H
IC901 ⑲
❻
0.6Vp-p
H
Q901 Ⓢ

CAUTIONS FOR REPLACING THE CCD IMAGER

- According to type of CCD imager (IC901 on the CD-14 board), it is necessary to require the compensating ROM (IC003 on the DT-74 board).
  The repairing CCD imager does not require the compensating ROM.
  So when replacing the CCD imager on which the compensating ROM is installed, remove the compensating ROM before replacement.
- Since the mounted CD-14 and DT-74 boards ehich are supplied asa repair parts are not installed IC901 and IC003 respectively, replace the respective ICs from the previous board to the new when replacing each board.
- When you replaced the CCD imager, porform the overall camera head adjustment.
- CCD imager has such a structure that it may be spoiled by static electricityy, so handle it with a care similar for MOS IC. Further, be sure that the light receiving part has no stick of dust and no entry of bright light.

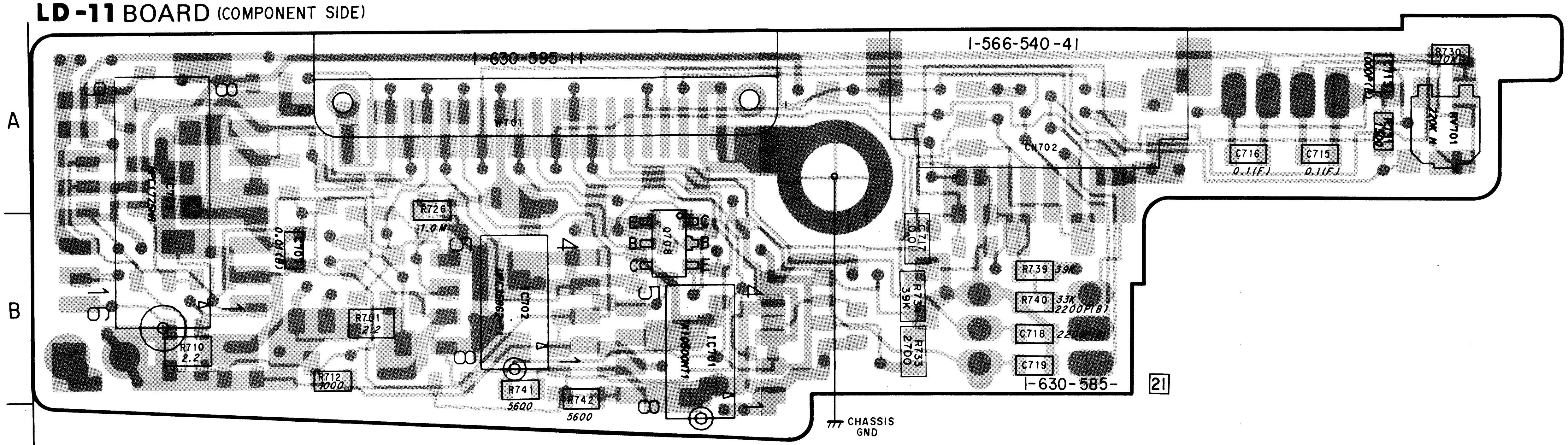
LD-11 (IRIS/FOCUS/ZOOM/MOTOR DRIVE) PRINTED WIRING BOARDS

— Ref. No. LD-11 BOARD: 3000 series —

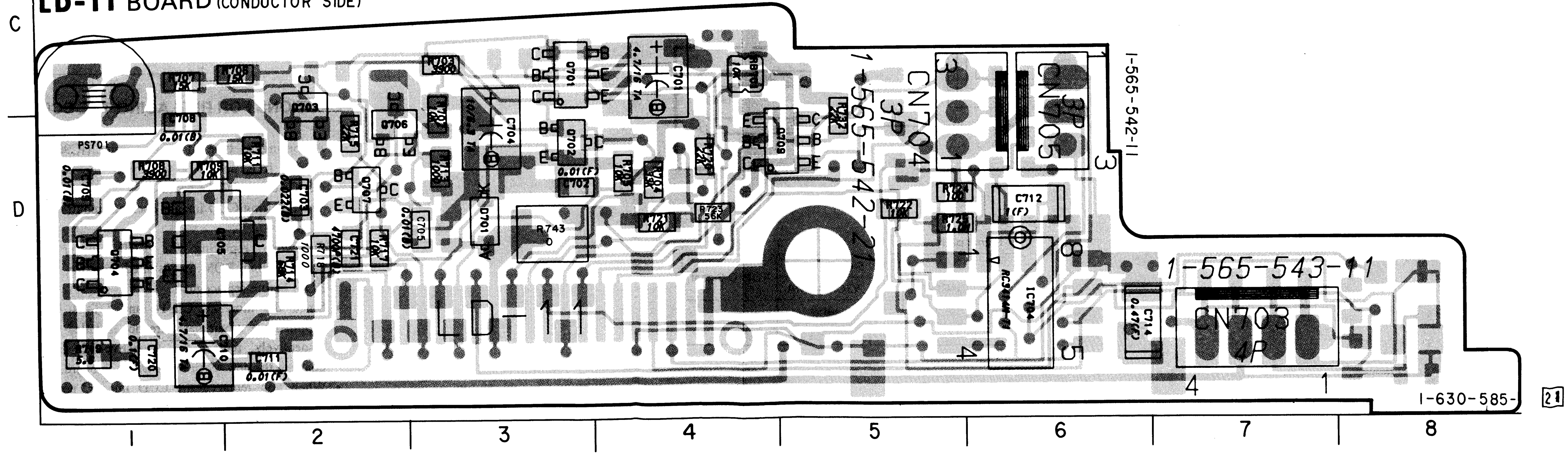
- **For printed wiring boards.**
- LD-11 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- Through hole (⊗) is omitted.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the pattern face are indicated.

LD-11 BOARD (COMPONENT SIDE)


A
B
1-630-595-11
W701
1-566-540-41
CN702
R730 10K
RV701 220K
C716 0.1(F)
C715 0.1(F)
IC711
R726 1.0M
C710 0.01(B)
IC702
Q708
R701 2.2
R710 2.2
R712 1000
R741 5600
R742 5600
IC701
C717 0.01
R734 39K
R733 2700
R739 39K
R740 33K
C718 2200P(B)
C719
1-630-585-
21
CHASSIS GND

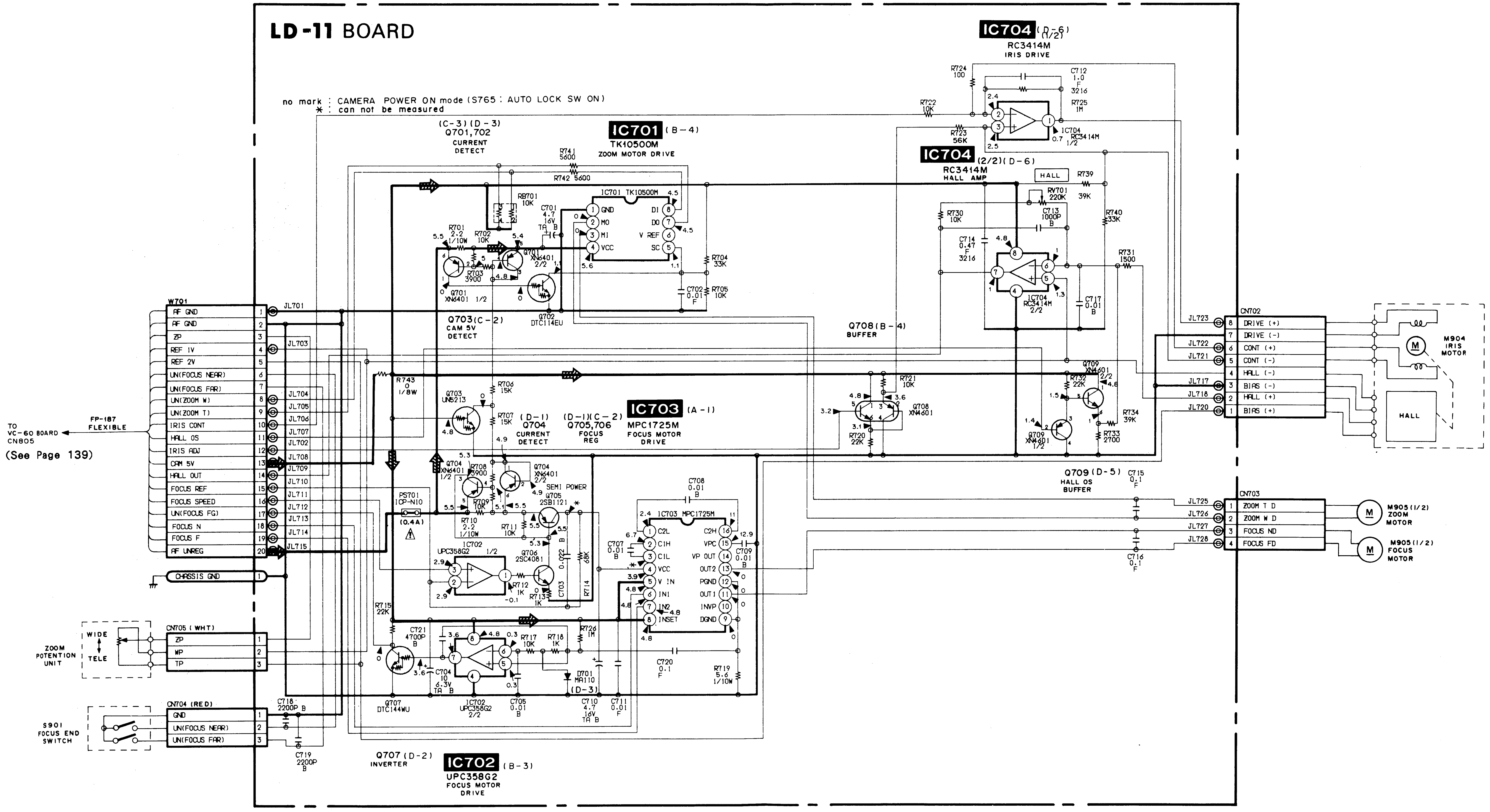
LD-11 BOARD (CONDUCTOR SIDE)


C
D
PS701
R707 15K
R706 15K
R708
R709 3900
R703 3900
Q701
Q702
Q704
Q705
Q706
Q707
Q709
C701 4.7/16 TA
C704
C705
C702 0.01(F)
C710
C711 0.01(F)
C720
D701
R743
R721 10K
R722 10K
CN704 3P
CN705 3P
1-565-542-11
1-565-542-21
C712 1(F)
IC704
C714 0.47(F)
1-565-543-11
CN703 4P
1-630-585-
21
1
2
3
4
5
6
7
8

LD-11 (IRIS/FOCUS/ZOOM/MOTOR DRIVE) SCHEMATIC DIAGRAMS

— Ref. No. LD-11 BOARD: 3000 series —

- **For schematic diagrams.**
- The code shown like (C-9) for each semiconductor indicates the position of location address on the printed wiring board.



LD-11 BOARD
no mark : CAMERA POWER ON mode (S765 : AUTO LOCK SW ON)
* : can not be measured
IC701 (B-4) TK10500M ZOOM MOTOR DRIVE
IC702 (B-3) UPC358G2 FOCUS MOTOR DRIVE
IC703 (A-1) MPC1725M FOCUS MOTOR DRIVE
IC704 (D-6) (1/2) RC3414M IRIS DRIVE
IC704 (2/2) (D-6) RC3414M HALL AMP
(C-3) (D-3) Q701,702 CURRENT DETECT
Q703 (C-2) CAM 5V DETECT
(D-1) Q704 CURRENT DETECT
(D-1)(C-2) Q705,706 FOCUS REG
Q707 (D-2) INVERTER
Q708 (B-4) BUFFER
Q709 (D-5) HALL OS BUFFER
W701
RF GND
RF GND
ZP
REF 1V
REF 2V
UN(FOCUS NEAR)
UN(FOCUS FAR)
UN(ZOOM W)
UN(ZOOM T)
IRIS CONT
HALL OS
IRIS ADJ
CAM 5V
HALL OUT
FOCUS REF
FOCUS SPEED
UN(FOCUS FG)
FOCUS N
FOCUS F
RF UNREG
CHASSIS GND
TO VC-60 BOARD CN805
FP-187 FLEXIBLE
(See Page 139)
CN705 (WHT)
ZP
WP
TP
ZOOM POTENTION UNIT
WIDE
TELE
CN704 (RED)
GND
UN(FOCUS NEAR)
UN(FOCUS FAR)
S901 FOCUS END SWITCH
PS701 ICP-N10 (0.4A)
CN702
DRIVE (+)
DRIVE (-)
CONT (+)
CONT (-)
HALL (-)
BIAS (-)
HALL (+)
BIAS (+)
M904 IRIS MOTOR
HALL
CN703
ZOOM T D
ZOOM W D
FOCUS ND
FOCUS FD
M905 (1/2) ZOOM MOTOR
M905 (1/2) FOCUS MOTOR

TI-15 (DIGITAL TITLER) PRINTED WIRING BOARDS

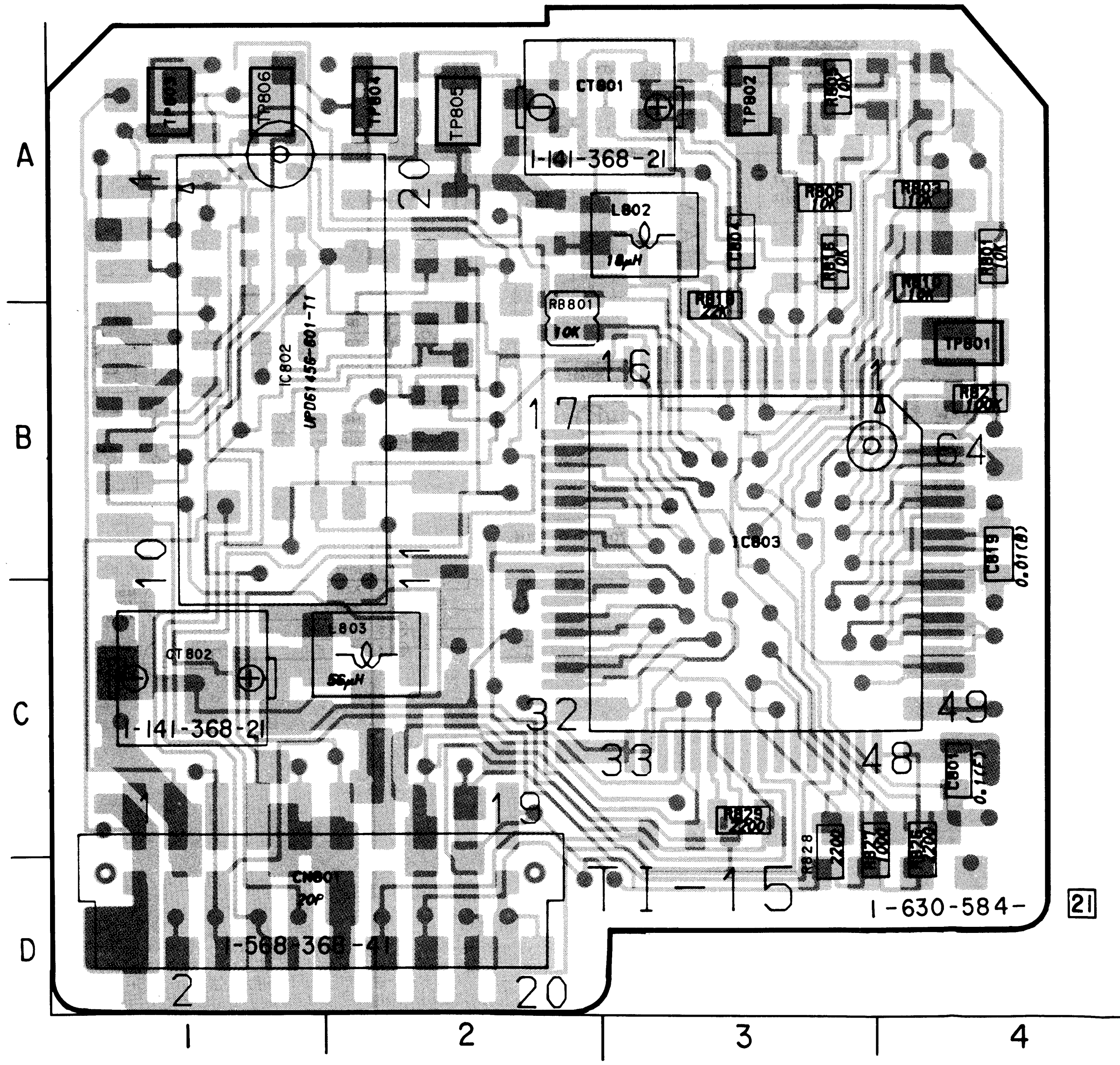
— Ref. No. TI-15 BOARD: 4000 series —

- **For printed wiring boards.**
- TI-15 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- Through hole (⊗) is omitted.

Caution:

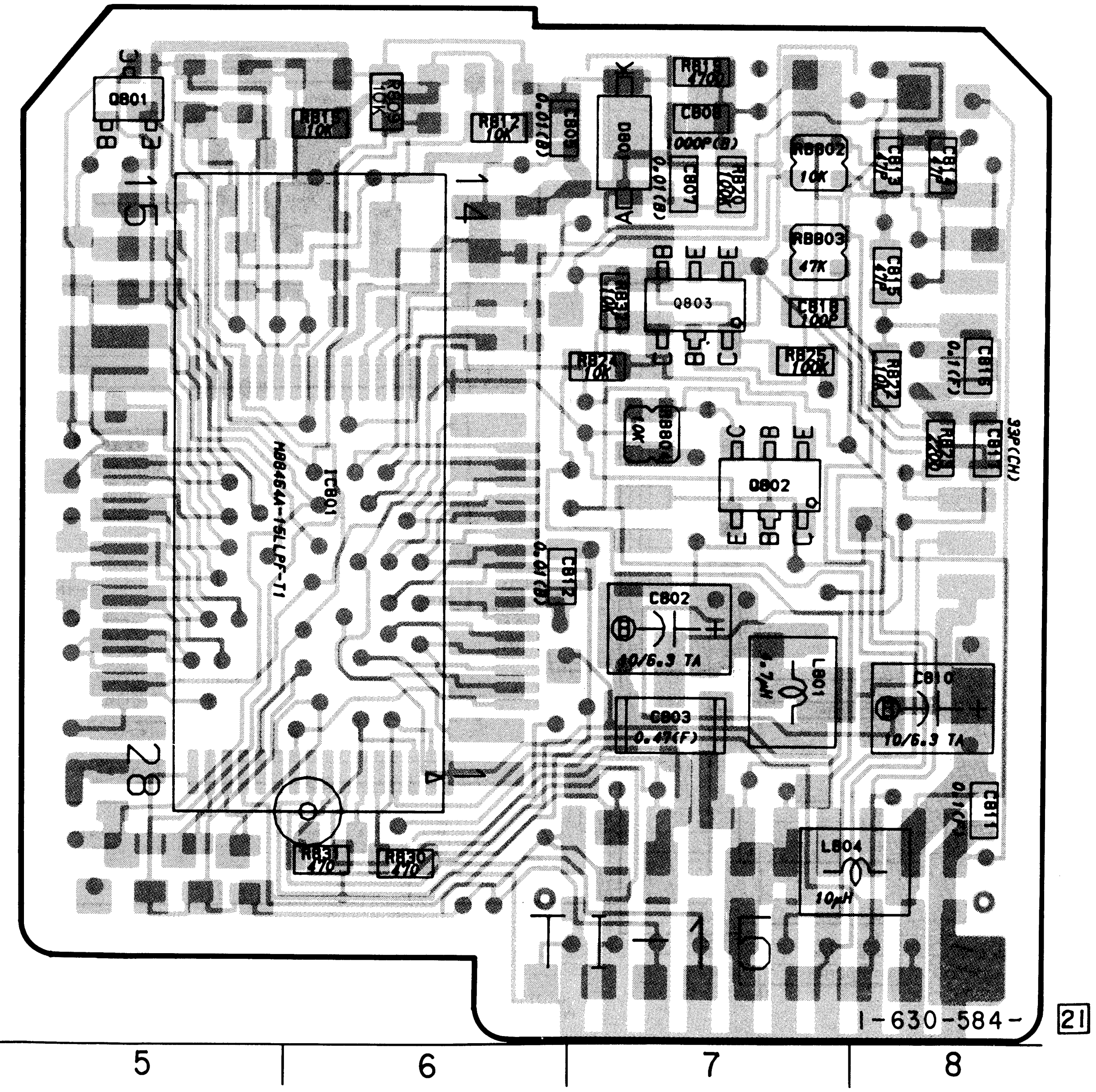
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the pattern face are indicated.

TI-15 BOARD (COMPONENT SIDE)



A
B
C
D
1
2
3
4
TP803
TP806
TP804
TP805
CT801
1-141-368-21
TP802
R809 10K
L802
18μH
R806 10K
R803 10K
R816 10K
R801 10K
R818 10K
L804
RB801 10K
R819 22K
TP801
R821 100K
IC802
UPD6145G-601-T1
IC803
C819 0.01(B)
CT802
1-141-368-21
L803
56μH
C801 0.1(F)
R825 2200
R828 2200
R827 1000
R826 2200
CN801
20P
1-568-368-41
TI-15
1-630-584-
21
1
10
11
16
17
20
32
33
48
49
64
19
2
20

TI-15 BOARD (CONDUCTOR SIDE)

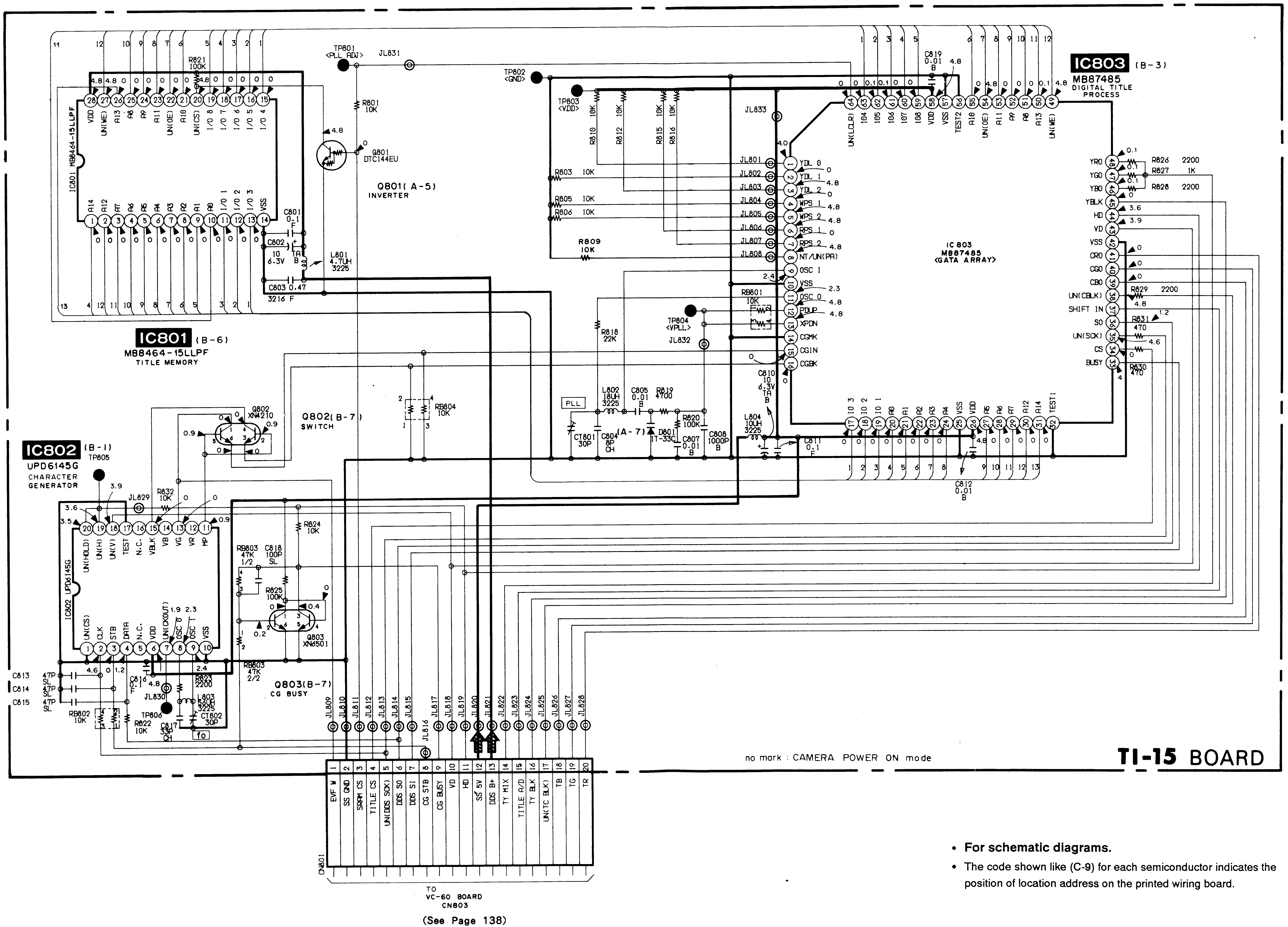


5
6
7
8
Q801
D801
R813 10K
R810 10K
R817 10K
C808 0.01(B)
R819 470Ω
C809 1000P(B)
C807 0.01(B)
R820 100K
RB802 10K
C813 47P
C814 47P
RB803 47K
C815 47P
Q803
R823 10K
R824 10K
C818 100P
R825 100K
R822 10K
C816 0.1(F)
RB804 10K
Q802
R829 470Ω
C817 33P(CH)
IC801
M58464-15LP-T1
C812 0.01(B)
C802
10/6.3 TA
L801
4.7μH
C810
10/6.3 TA
C803 0.47(F)
C811 0.01(B)
L804
10μH
R831 470
R830 470
1
14
15
28
TI-15
1-630-584-
21

1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15

— Ref. No. TI-15 BOARD: 4000 series —

A
B
C
D
E
F
G
H
I
J


IC801 (B-6)
MB8464-15LLPF
TITLE MEMORY
IC802 (B-1)
UPD6145G
CHARACTER GENERATOR
IC803 (B-3)
MB87485
DIGITAL TITLE PROCESS
IC 803
MB87485
<GATA ARRAY>
Q801 (A-5)
INVERTER
Q801 DTC144EU
Q802 (B-7)
SWITCH
Q802 XN4210
Q803 (B-7)
CG BUSY
Q803 XN6501
TP801 <PLL ADJ>
TP802 <GND>
TP803 <VDD>
TP804 <VPLL>
TP805
TP806
PLL
fo
CN801
TO VC-60 BOARD CN803
(See Page 138)
1 EVF W
2 SS GND
3 SRAM CS
4 TITLE CS
5 UN(DDS SCK)
6 DDS SO
7 DDS SI
8 CG STB
9 CG BUSY
10 VD
11 HD
12 SS 5V
13 DDS B+
14 TY MIX
15 TITLE A/D
16 TY BLK
17 UN(TC BLK)
18 TB
19 TG
20 TR
no mark : CAMERA POWER ON mode
TI-15 BOARD

- **For schematic diagrams.**
- The code shown like (C-9) for each semiconductor indicates the position of location address on the printed wiring board.

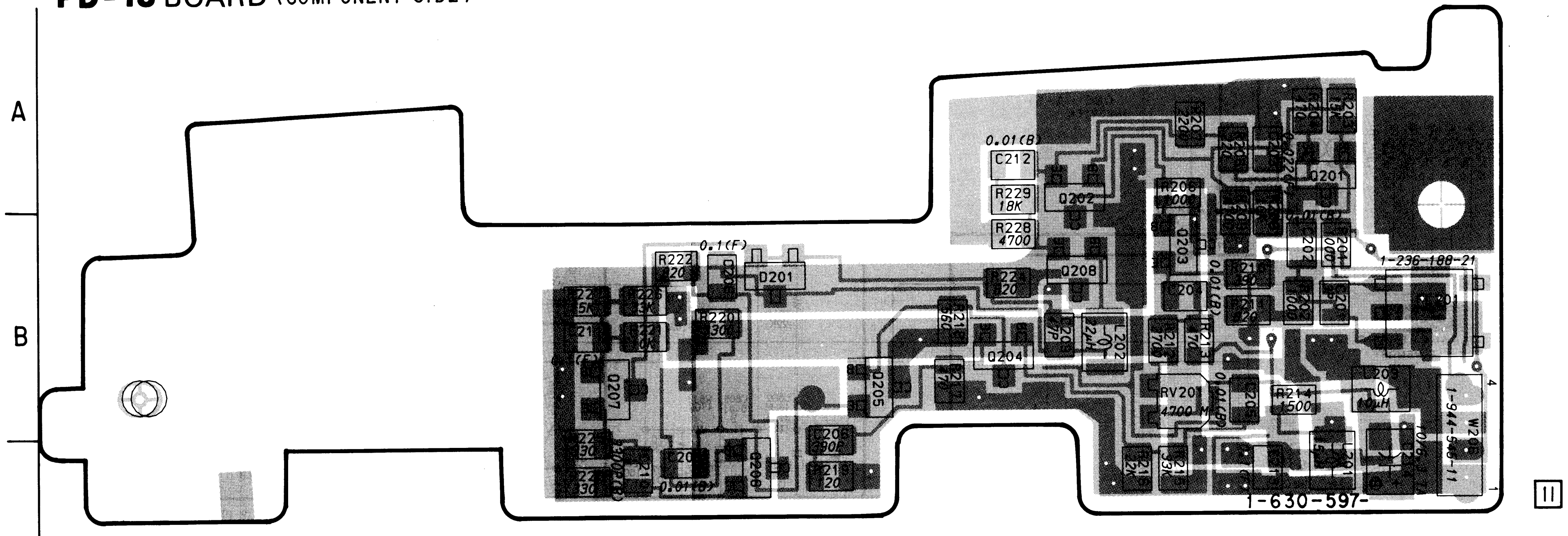
PD-18 (CHROMA NOISE REDUCTION) PRINTED WIRING BOARDS

— Ref. No. PD-18 BOARD: 4000 series —

- **For printed wiring boards.**
- Through hole (⊗) is omitted.

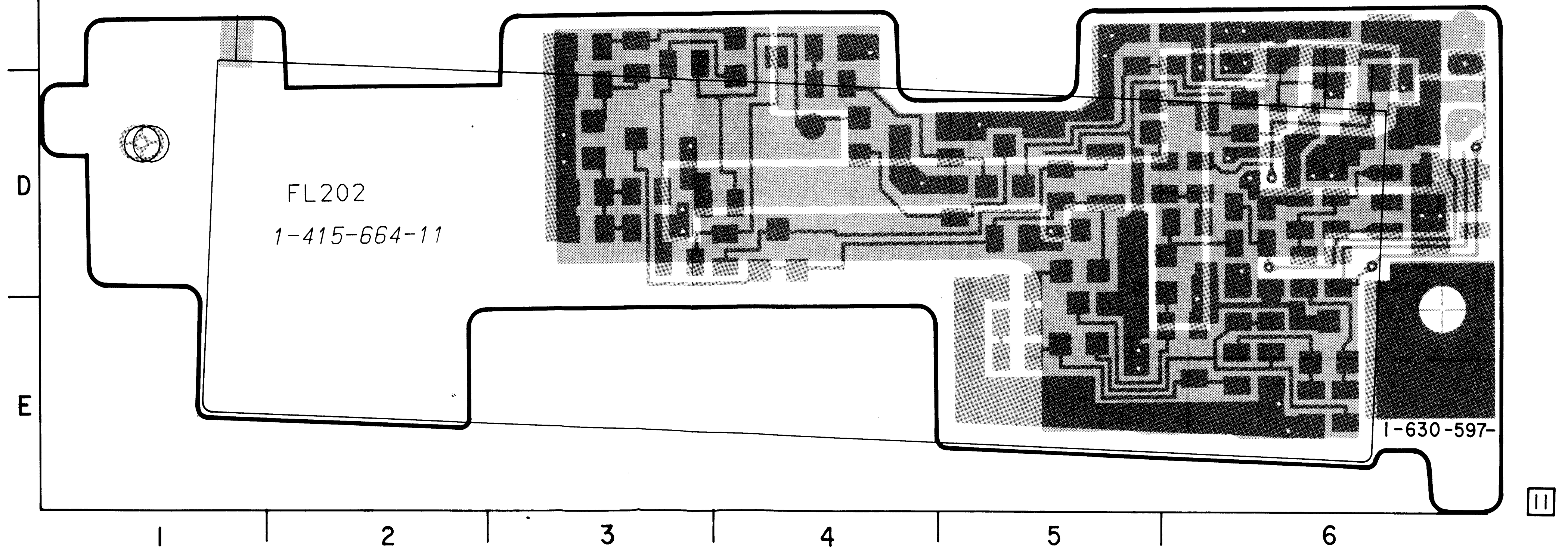
Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the pattern face are indicated.

PD-18 BOARD (COMPONENT SIDE)


A
B
0.01(B)
C212
R229 18K
R228 4700
R222 220
0.1(F)
Q201
Q202
Q208
Q207
Q205
Q204
Q203
R220 330
R206 390P
R213 120
L202 12μH
RV201 4700
R214 1500
1-236-188-21
W201
1-630-597-
II

C

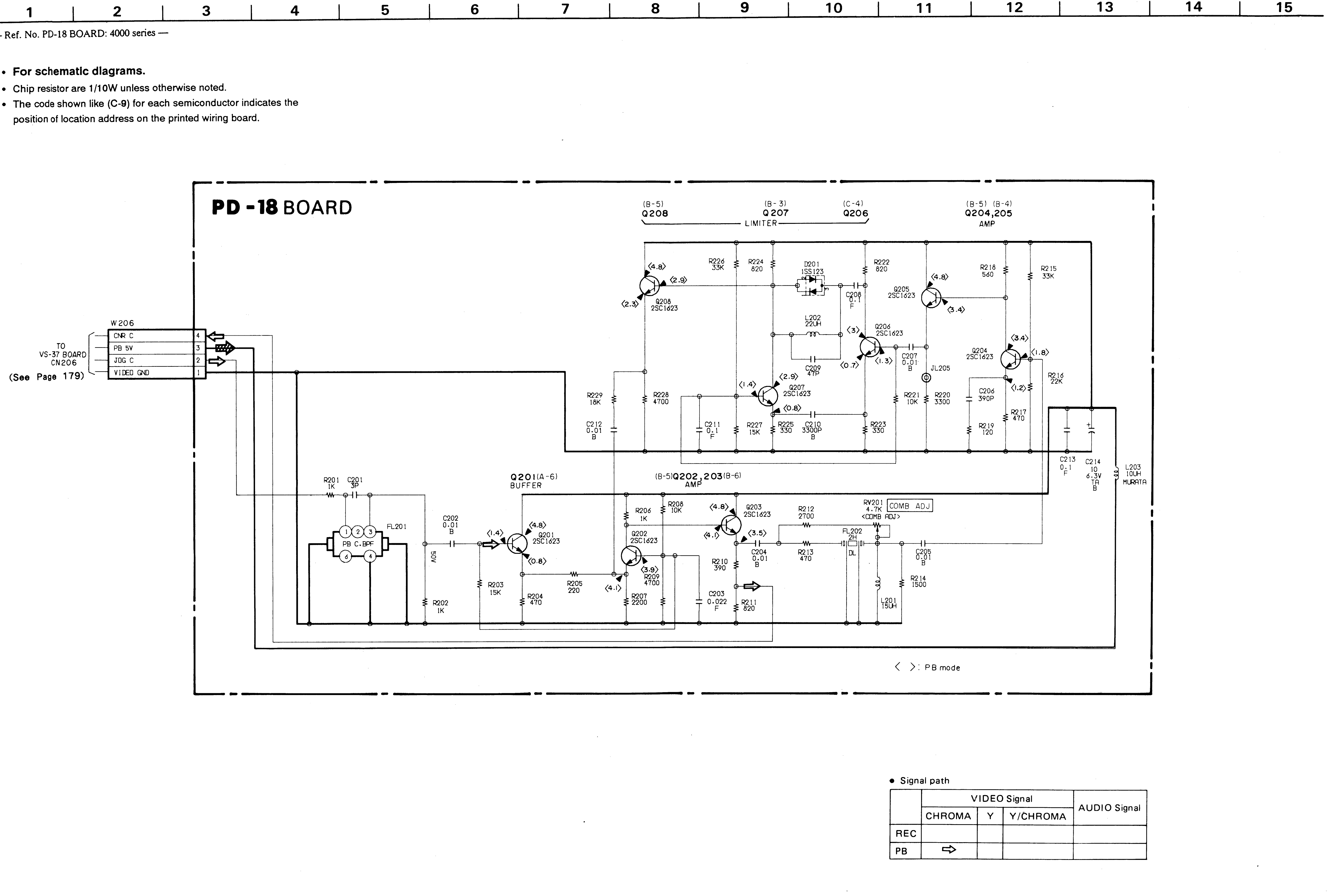
PD-18 BOARD (CONDUCTOR SIDE)


D
E
FL202
1-415-664-11
1-630-597-
II
1
2
3
4
5
6

PD-18 (CHROMA NOISE REDUCTION) SCHEMATIC DIAGRAMS

— Ref. No. PD-18 BOARD: 4000 series —

- **For schematic diagrams.**
- Chip resistor are 1/10W unless otherwise noted.
- The code shown like (C-9) for each semiconductor indicates the position of location address on the printed wiring board.


1
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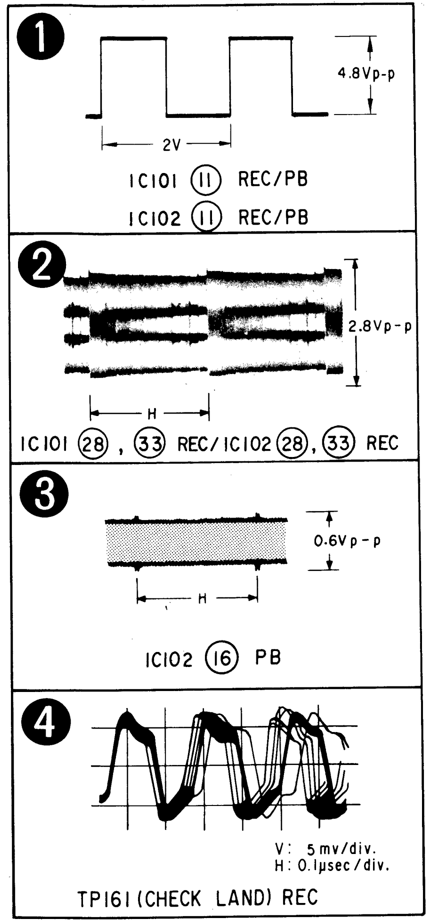
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
PD-18 BOARD
TO VS-37 BOARD CN206
(See Page 179)
W206
CNR C 4
PB 5V 3
JOG C 2
VIDEO GND 1
(B-5) Q208
(B-3) Q207
(C-4) Q206
LIMITER
(B-5) (B-4) Q204,205
AMP
Q208 2SC1623
〈4.8〉
〈2.9〉
〈2.3〉
R226 33K
R224 820
D201 1SS123
C208 0.1 F
R222 820
Q205 2SC1623
〈4.8〉
〈3.4〉
R218 560
R215 33K
L202 22UH
C209 47P
Q206 2SC1623
〈3〉
〈0.7〉
〈1.3〉
C207 0.01 B
JL205
Q204 2SC1623
〈3.4〉
〈1.8〉
〈1.2〉
R216 22K
Q207 2SC1623
〈1.4〉
〈2.9〉
〈0.8〉
R229 18K
R228 4700
C212 0.01 B
C211 0.1 F
R227 15K
R225 330
C210 3300P B
R223 330
R221 10K
R220 3300
C206 390P
R219 120
R217 470
C213 0.1 F
C214 10 6.3V TA B
L203 10UH MURATA
R201 1K
C201 3P
FL201
PB C.BPF
1 2 3 6 4
C202 0.01 B
50V
R202 1K
Q201(A-6) BUFFER
Q201 2SC1623
〈1.4〉
〈4.8〉
〈0.8〉
R203 15K
R204 470
R205 220
(B-5)Q202,203(B-6) AMP
R206 1K
R208 10K
Q202 2SC1623
〈4.1〉
〈3.9〉
R209 4700
R207 2200
Q203 2SC1623
〈4.8〉
〈4.1〉
〈3.5〉
C204 0.01 B
R210 390
C203 0.022 F
R211 820
R212 2700
R213 470
RV201 4.7K
COMB ADJ
<COMB ADJ>
FL202 2H
DL
L201 15UH
R214 1500
C205 0.01 B
〈 〉: PB mode

- Signal path

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC				
PB	⇨			

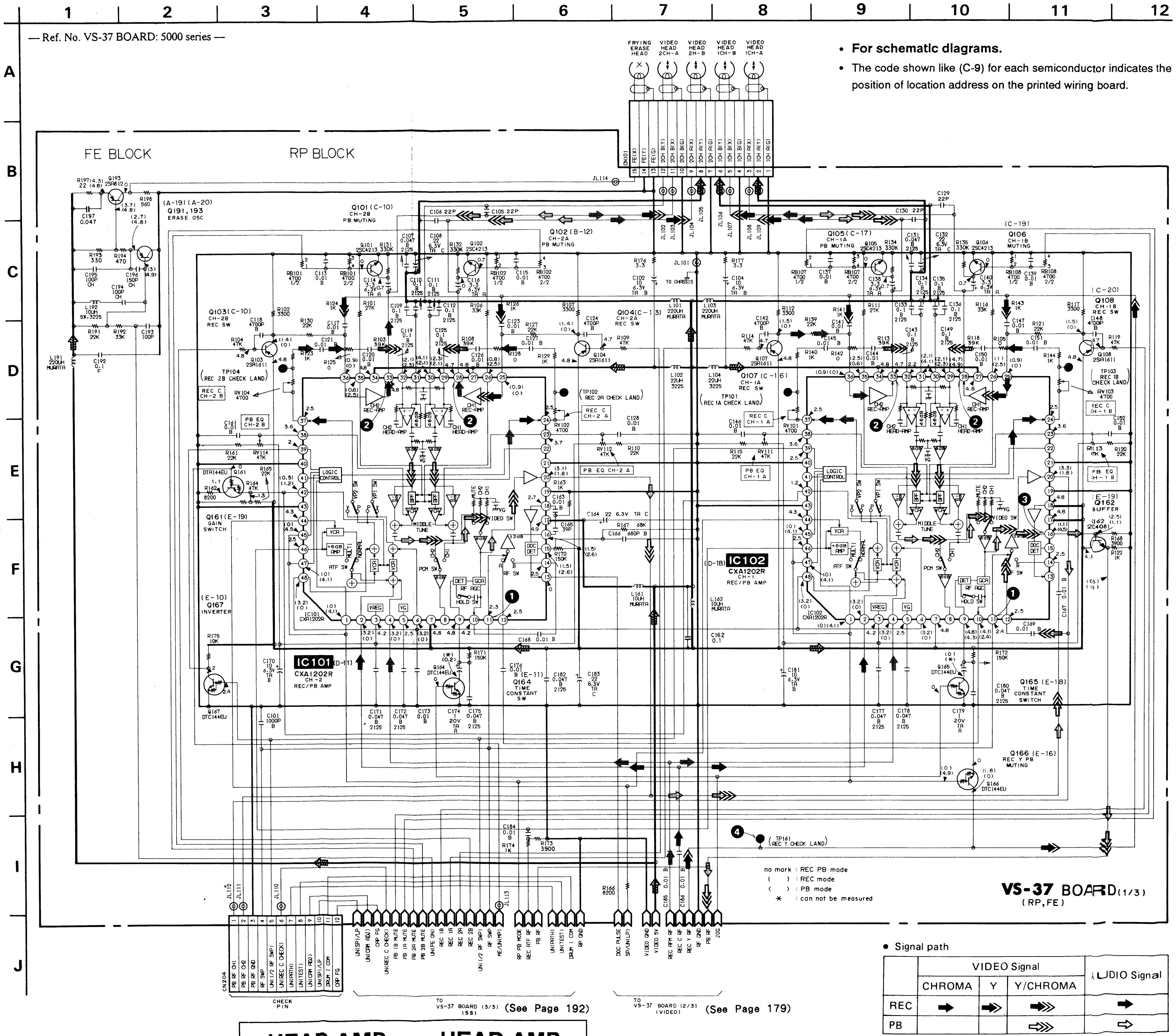
VS-37 BOARD (RP/FE)



VS-37 (HEAD AMP) SCHEMATIC DIAGRAMS

— Ref. No. VS-37 BOARD: 5000 series —

- **For schematic diagrams.**
- The code shown like (C-9) for each semiconductor indicates the position of location address on the printed wiring board.


1
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6
7
8
9
10
11
12
A
B
C
D
E
F
G
H
I
J
FRYING ERASE HEAD
VIDEO HEAD 2CH-A
VIDEO HEAD 2H-B
VIDEO HEAD 1CH-B
VIDEO HEAD 1CH-A
FE BLOCK
RP BLOCK
CN101
Q191, 193 ERASE OSC
Q101 (C-10) CH-2B PB MUTING
Q102 (B-12) CH-2A PB MUTING
Q103 (C-10) CH-2B REC SW
Q104 (C-13) CH-2A REC SW
Q105 (C-17) CH-1A PB MUTING
Q106 CH-1B MUTING
Q107 (C-16) CH-1A REC SW
Q108 CH-1B REC SW
Q161 (E-19) GAIN SWITCH
Q162 BUFFER
Q164 TIME CONSTANT SW
Q165 (E-18) TIME CONSTANT SWITCH
Q166 (E-16) REC Y PB MUTING
Q167 INVERTER
IC101 (D-11) CXA1202R CH-2 REC/PB AMP
IC102 (D-18) CXA1202R CH-1 REC/PB AMP
TP101 REC 1A CHECK LAND
TP102 REC 2A CHECK LAND
TP103 REC 1B CHECK LAND
TP104 REC 2B CHECK LAND
TP161 REC Y CHECK LAND
LOGIC CONTROL
MIDDLE TUNE
VIDEO SW
PCM SW
RF SW
HOLD SW
RF AGC
CH2 REC-AMP
CH1 REC-AMP
CH2 HEAD-AMP
CH1 HEAD-AMP
PB EQ CH-2 A
PB EQ CH-1 A
REC C CH-2 A
REC C CH-1 A
CN204
CHECK PIN
TO VS-37 BOARD (3/3) (SS) (See Page 192)
TO VS-37 BOARD (2/3) (VIDEO) (See Page 179)

no mark : REC PB mode
( ) : REC mode
⟨ ⟩ : PB mode
＊ : can not be measured

VS-37 BOARD (1/3)
(RP, FE)

- Signal path

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC	➡	⇛	⇛	➡
PB			⇨	⇨

VS-37 (HEAD AMP, VIDEO, SERVO/SYSTEM CONTROL) PRINTED WIRING BOARDS

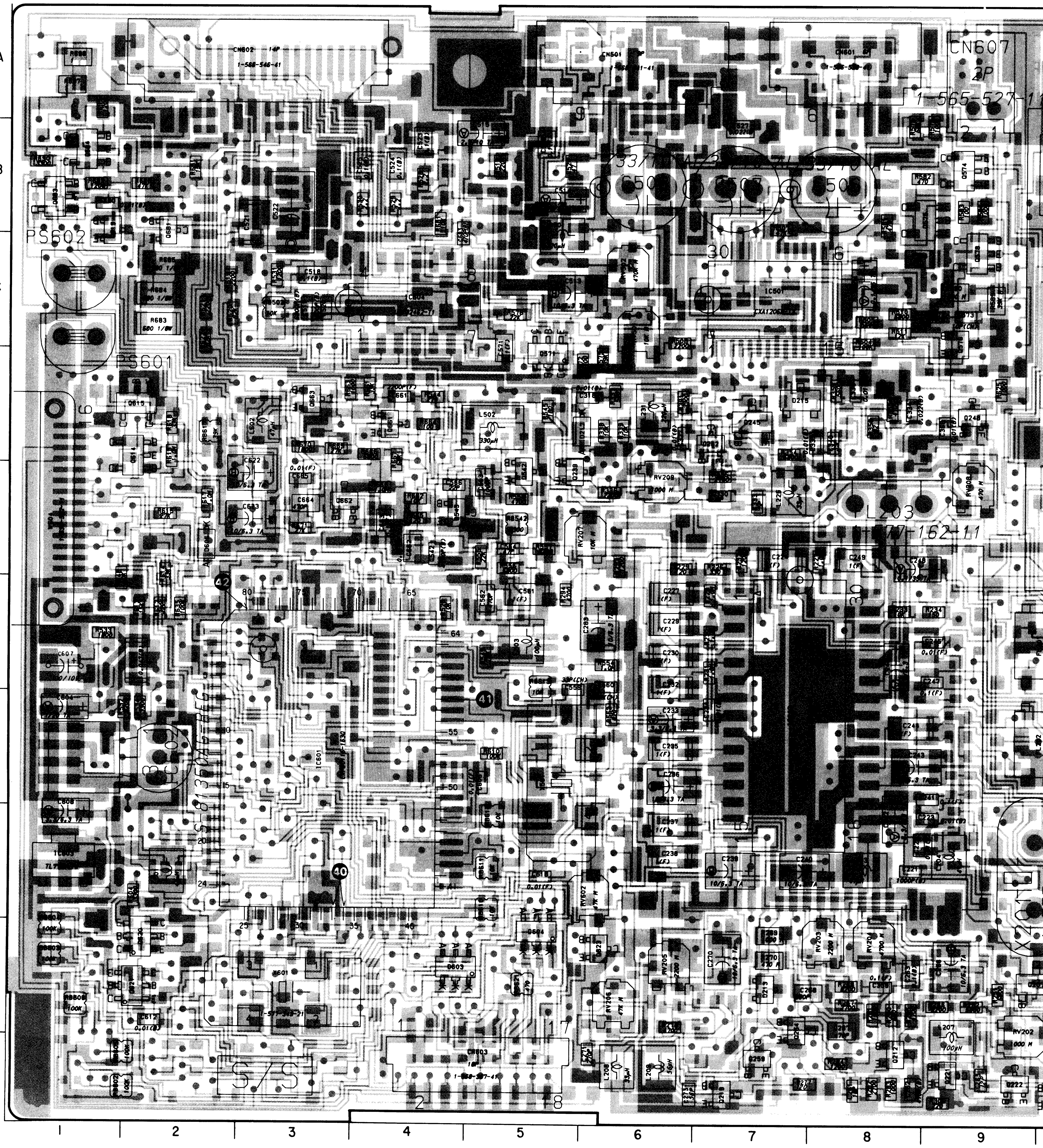
— Ref. No. VS-37 BOARD: 5000 series —

- **For printed wiring boards.**
- VS-37 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- Through hole (⊗) is omitted.

Caution:

Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the pattern face are indicated.

VS-37 BOARD (COMPONENT SIDE)


A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
9
CN602 14P
CN501
CN601
CN607
2P
1-565-527-11
PS602
PS601
IC601
IC501
L502
L203
RV209
RV207
RV602
CN603
S/S
40
41
42
80
75
70
65
64
55
50
25
30
35
40
1
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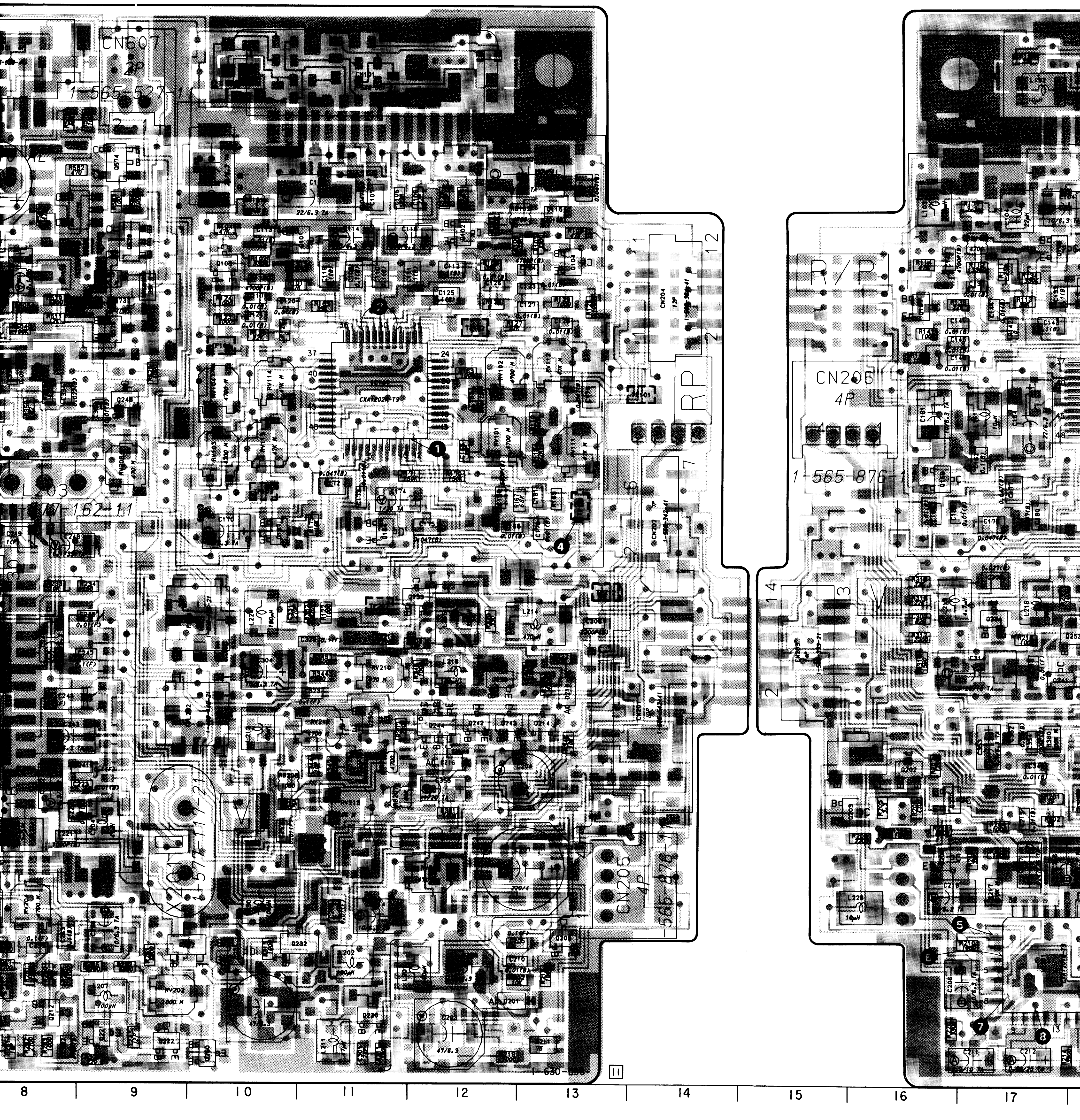
17
18

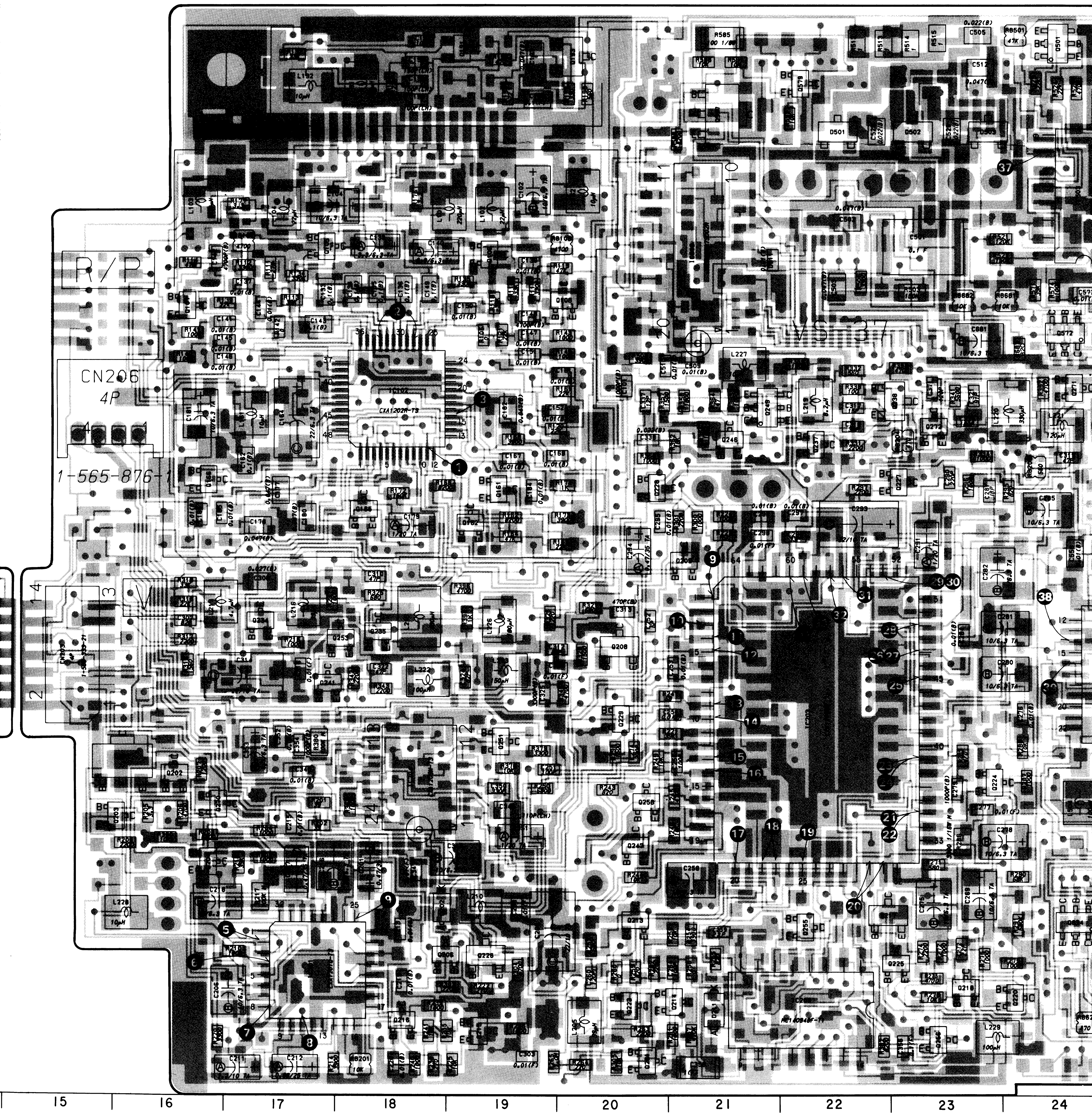
e pattern face side seen from
face are indicated.

e parts face side seen from the
e are indicated.

VS-37 BOARD (CONDUCTOR SIDE)


CN607
2P
1-565-527-11
CN204
R/P
RP
CN206
4P
1-565-876-11
IC101
CXA1202N-T3
L203
X201
1-577-117-21
CN205
4P
1-565-878-11
CN202
V
1-630-898-
11
8
9
10
11
12
13
14
15
16
17

VS-37 BOARD (CONDUCTOR SIDE)


R/P
CN206
4P
1-565-876-11
VS-37
CXA1202R-T3
15
16
17
18
19
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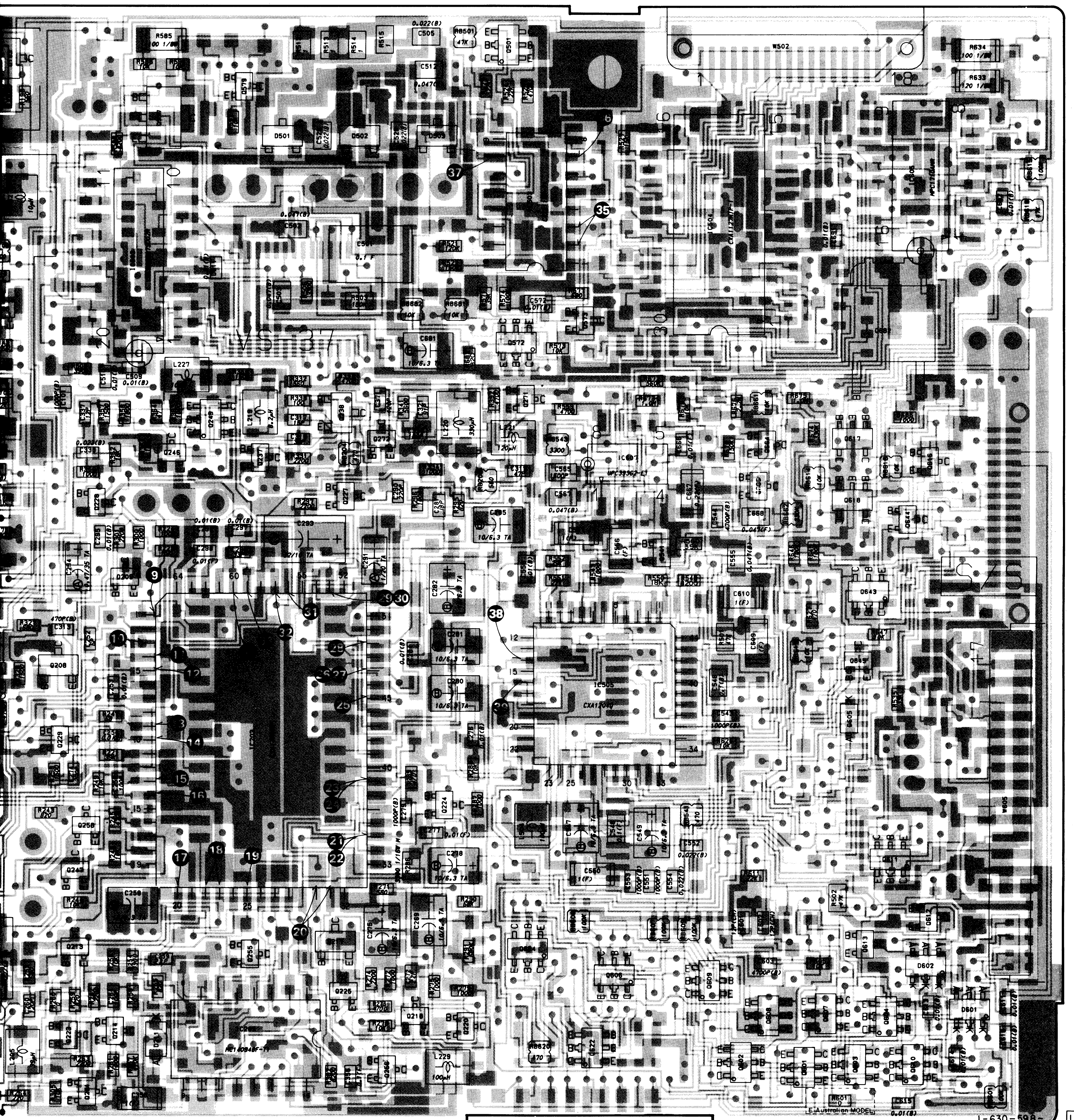
21
22
23
24


W502
R634
R633
R585
C505
C512
D501
D502
IC505
CXA1208Q
IC501
W605
D602
D601
Q643
L227
L229
E:Australian MODEL
1-630-598-
11
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22
23
24
25
26
27
28

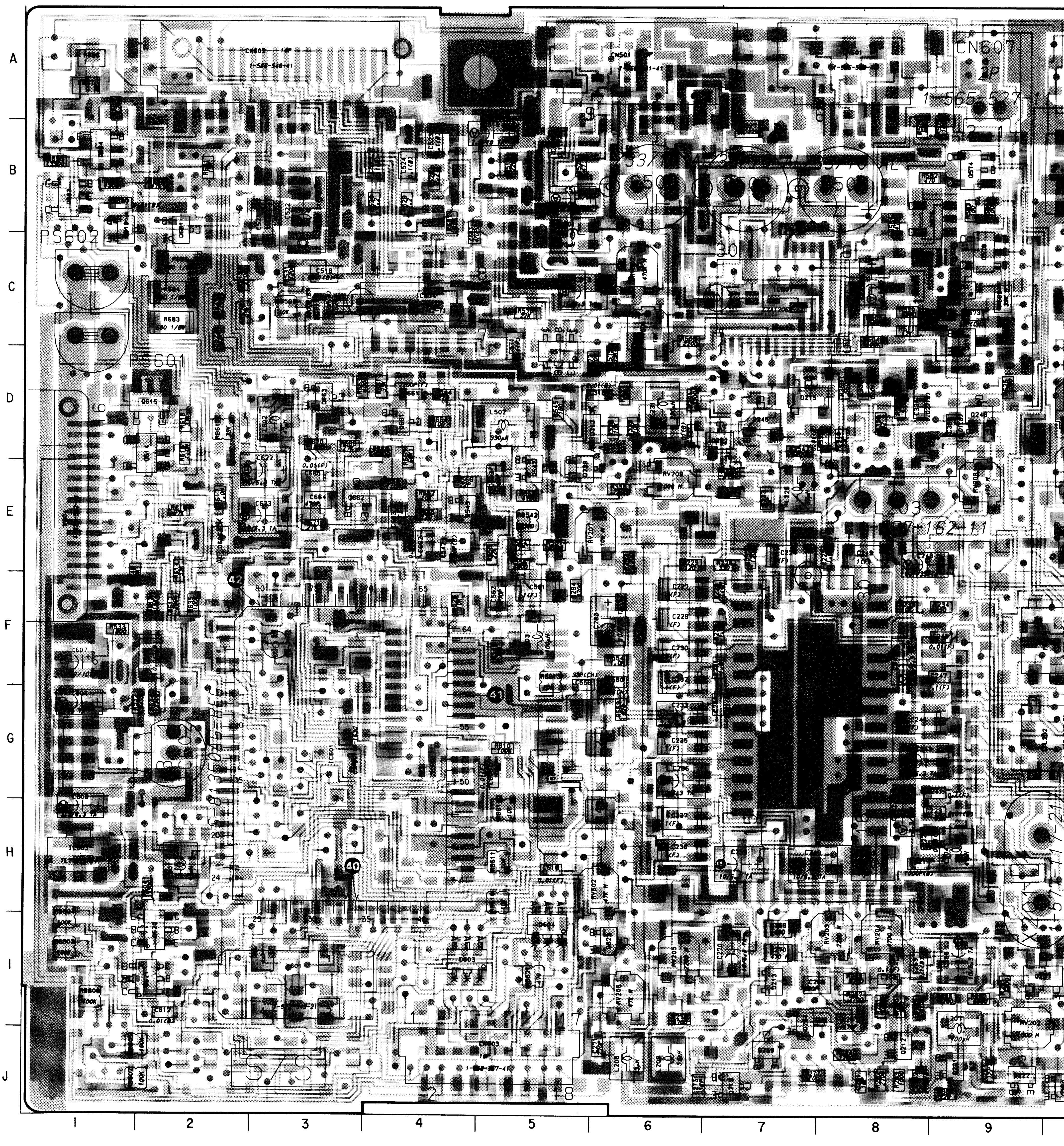
VS-37 (HEAD AMP, VIDEO, SERVO/SYSTEM CONTROL) PRINTED WIRING BOARDS

— Ref. No. VS-37 BOARD: 5000 series —

- **For printed wiring boards.**
- VS-37 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- Through hole (⊗) is omitted.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the pattern face are indicated.

VS-37 BOARD (COMPONENT SIDE)


A
B
C
D
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F
G
H
I
J
1
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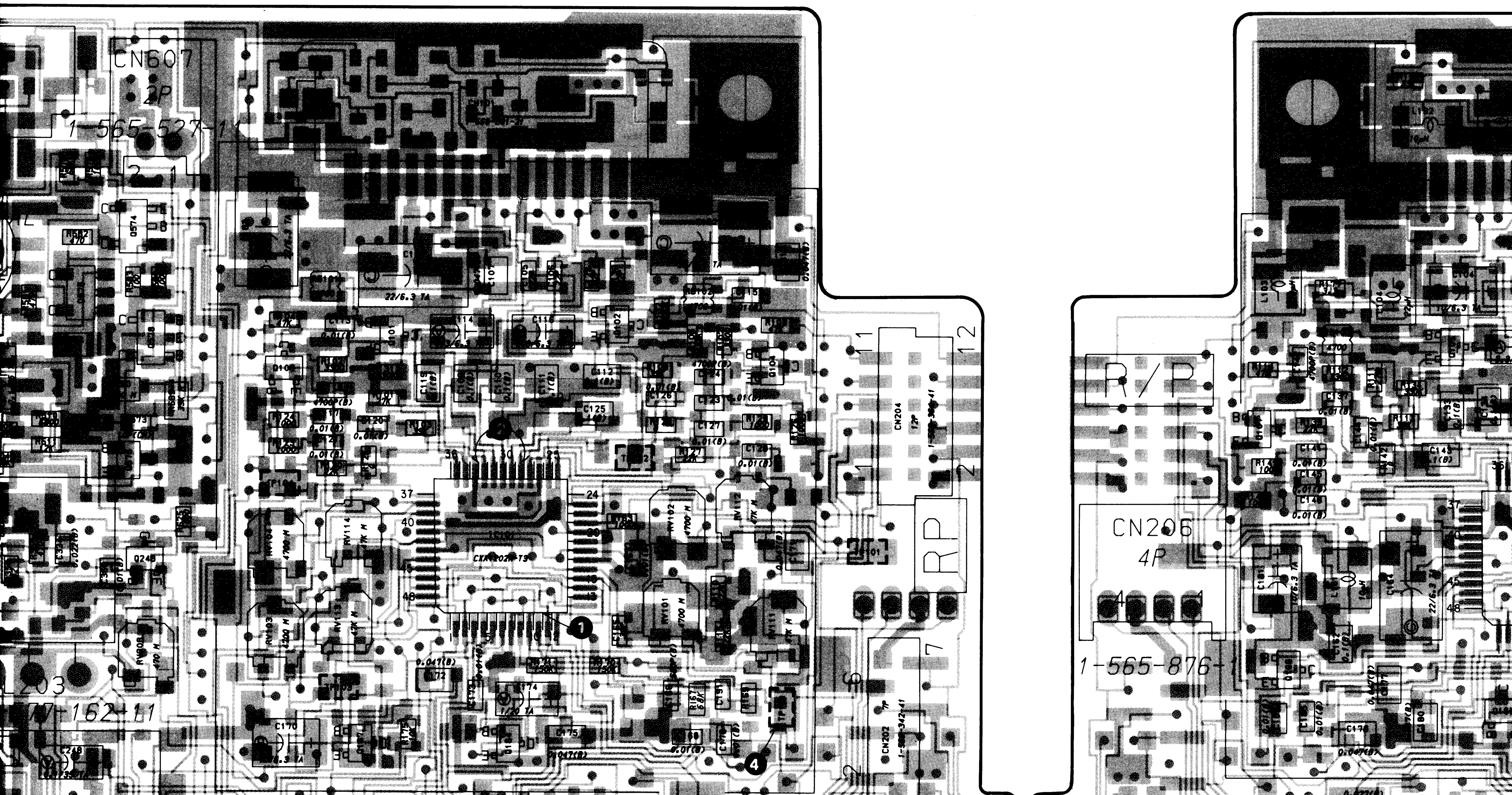
5
6
7
8
9
CN602 14P
1-568-546-41
CN501
CN601
CN607
2P
1-565-527-1
PS602
PS601
R683
680 1/8W
IC501
CXA1205
L502
330μH
L203
RV207
RV208
RV602
RV203
RV205
RV206
RV202
C607
C622
C623
C664
C227
C229
C230
C233
C235
C236
C239
C240
C270
IC601
S-8130 ... RFG
41
42
40
IC602
X601
CN603
18P
1-568-537-41
S/S
TL7
L208
L209
L207
100μH
X201

VS-37 BOARD (CONDUCTOR SIDE)


CN607
2P
1-565-527-11
CN204
12P
CN202
CN205
4P
1-565-876-11
CN206
4P
1-565-876-11
R/P
RP
CXA1202Q-TS
X201
L203
8
9
10
11
12
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14
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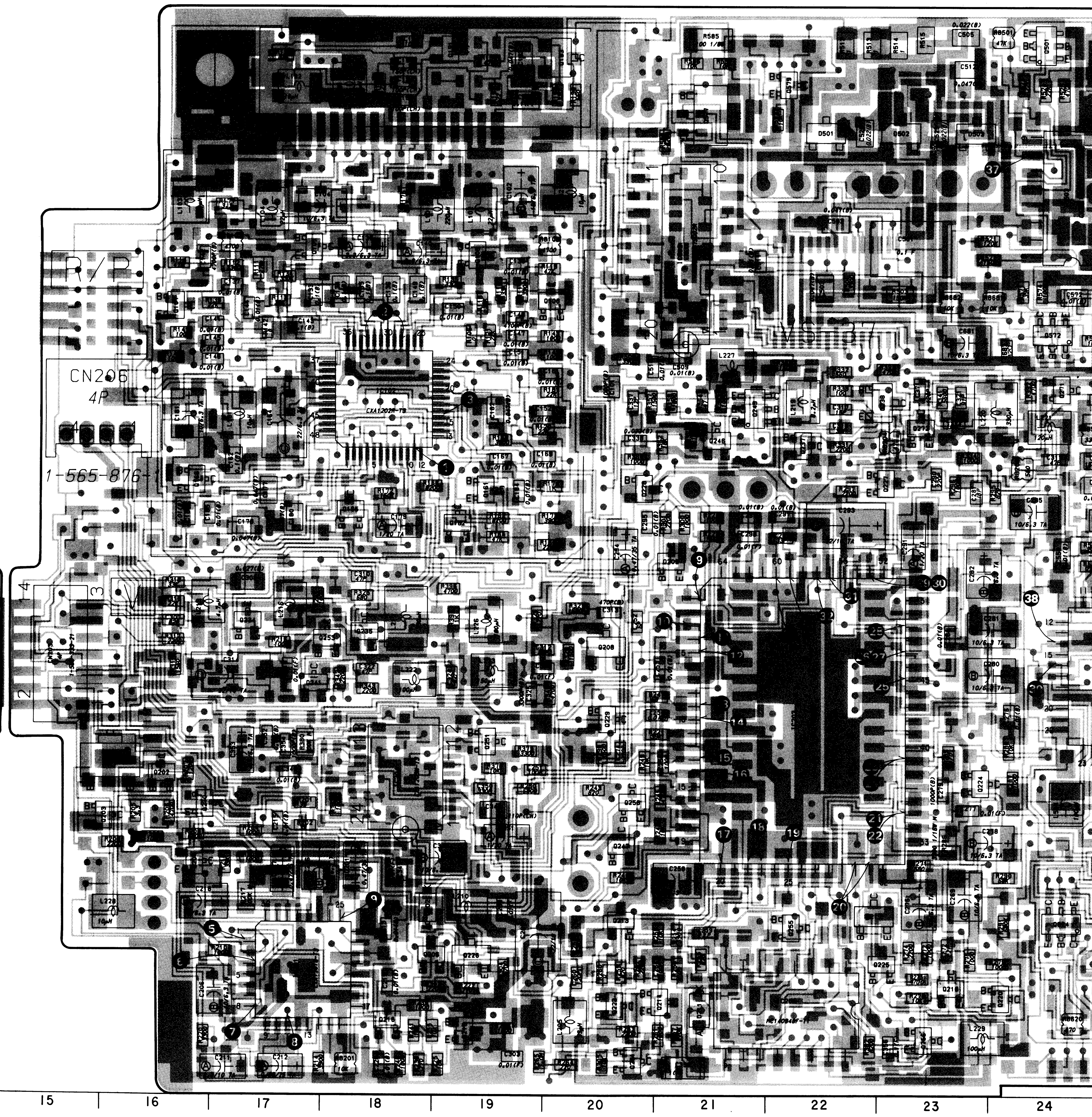
17

VIDEO **VIDEO**

VS-37 BOARD (CONDUCTOR SIDE)


R/P
CN206
4P
1-565-876-
CXA1202R-T8
VS-37
15
16
17
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19
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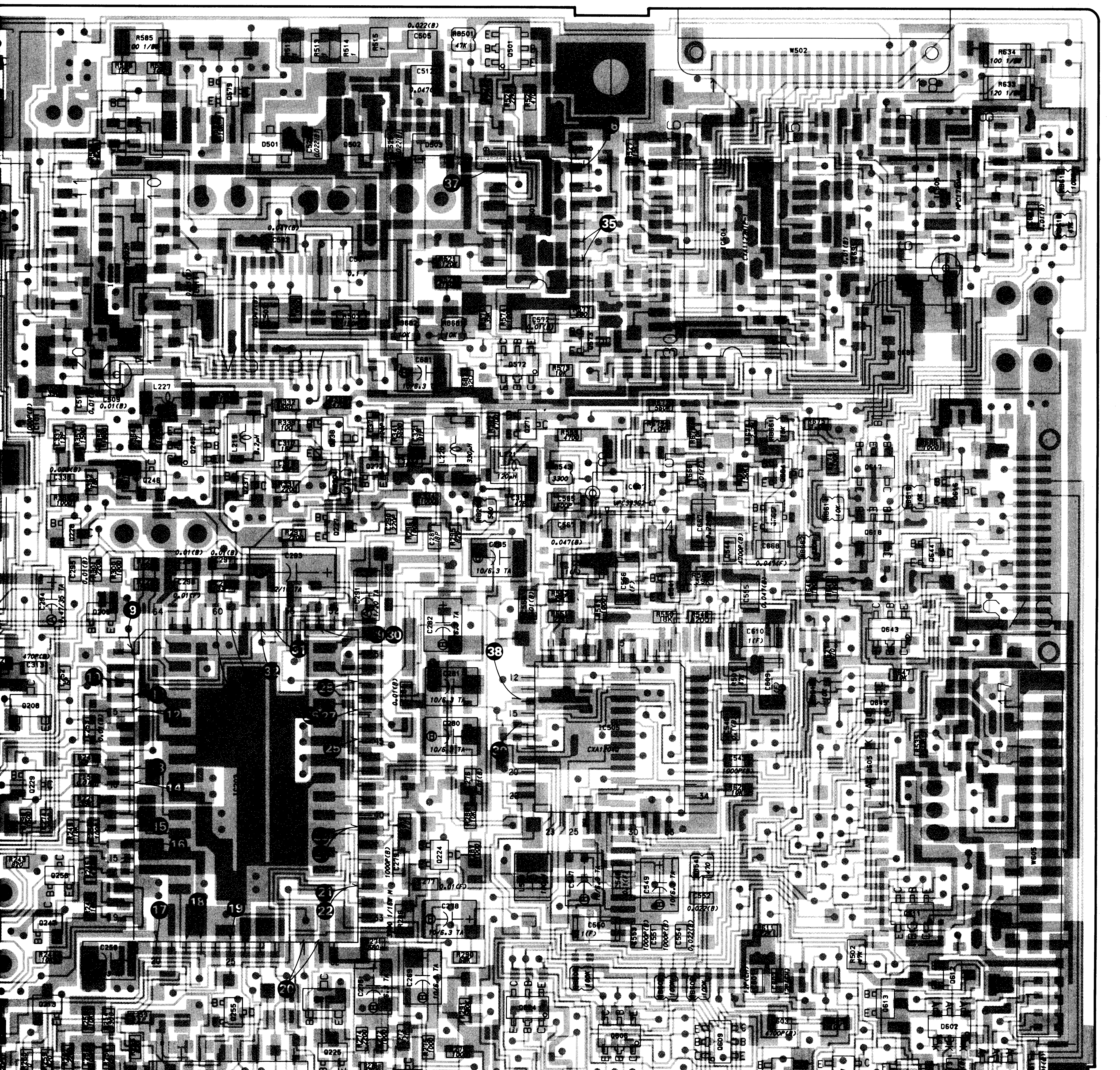
21
22
23
24


1-630-598-11
E,Australian MODEL
20
21
22
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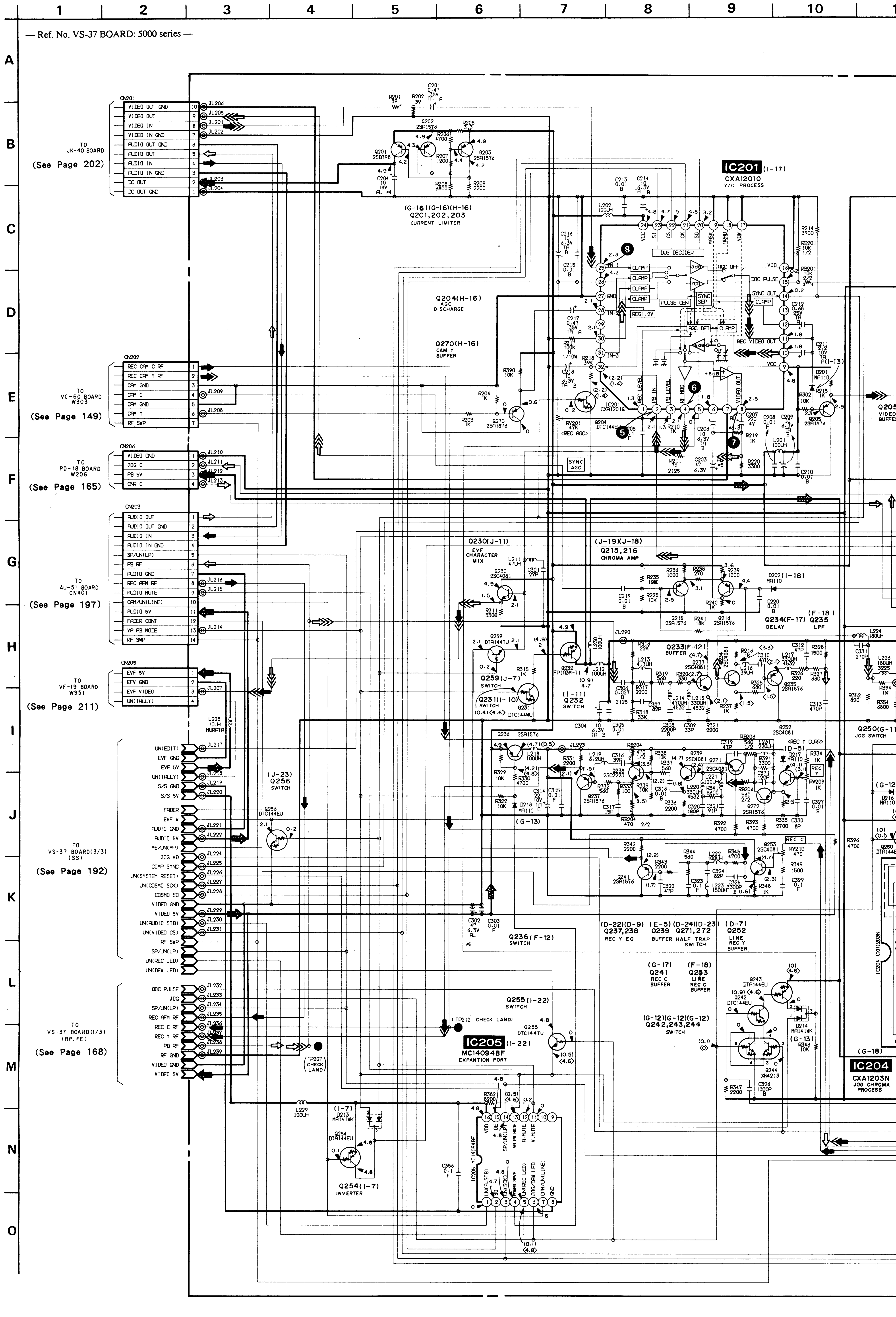
28

VIDEO VIDEO

— Ref. No. VS-37 BOARD: 5000 series —


1
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A
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D
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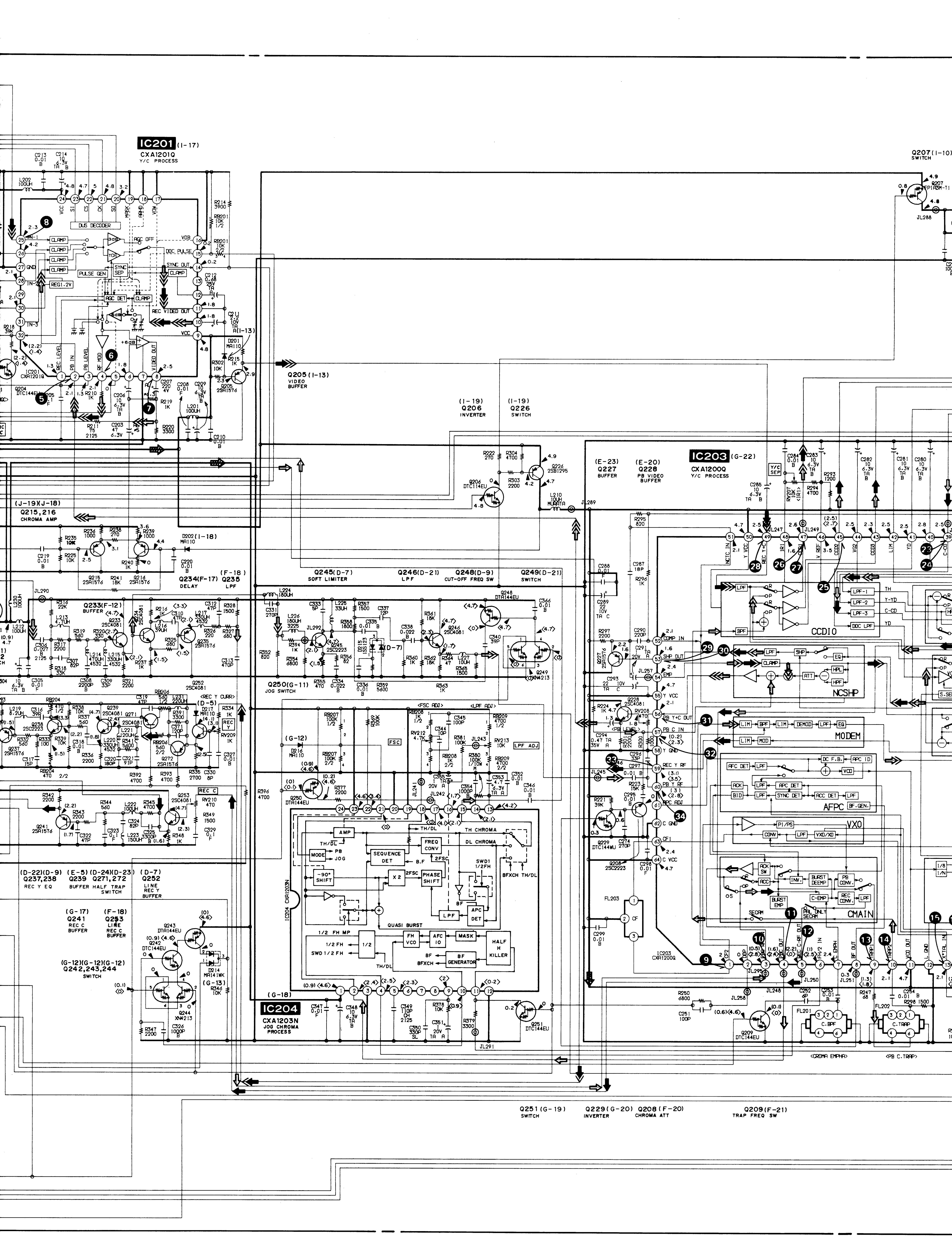
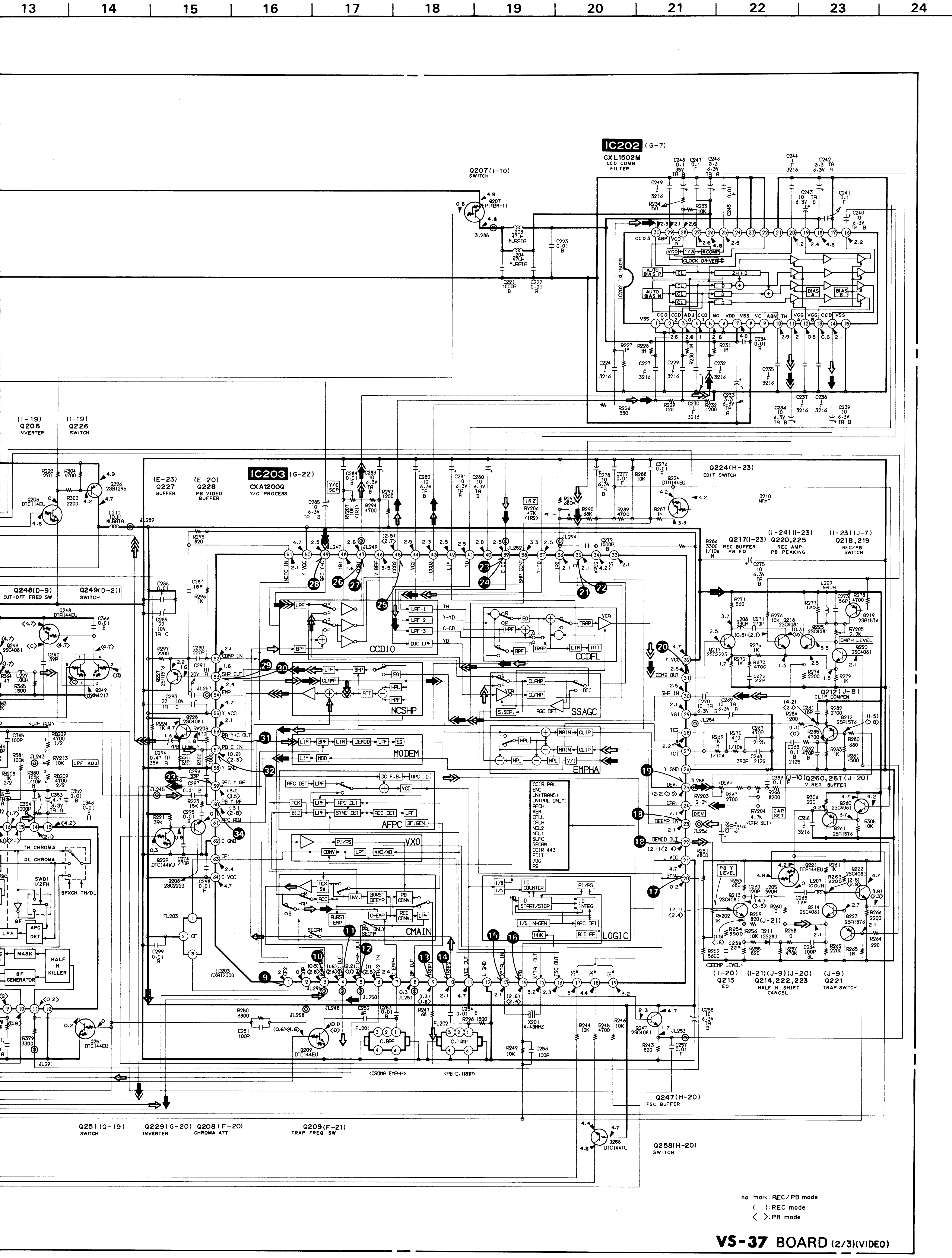
I
J
K
L
M
N
O
CN201
VIDEO OUT GND
VIDEO OUT
VIDEO IN
VIDEO IN GND
AUDIO OUT GND
AUDIO OUT
AUDIO IN
AUDIO IN GND
DC OUT
DC OUT GND
TO JK-40 BOARD
(See Page 202)
CN202
REC CAM C RF
REC CAM Y RF
CAM GND
CAM C
CAM GND
CAM Y
RF SWP
TO VC-60 BOARD W303
(See Page 149)
CN206
VIDEO GND
JOG C
PB 5V
CNR C
TO PD-18 BOARD W206
(See Page 165)
CN203
AUDIO OUT
AUDIO OUT GND
AUDIO IN
AUDIO IN GND
SP/LP(LP)
PB RF
AUDIO GND
REC AFM RF
AUDIO MUTE
CAM/UN(LINE)
AUDIO 5V
FADER CONT
VA PB MODE
RF SWP
TO AU-51 BOARD CN401
(See Page 197)
CN205
EVF 5V
EFV GND
EVF VIDEO
UN(TALLY)
TO VF-19 BOARD W951
(See Page 211)
UN(EDIT)
EVF GND
EVF 5V
UN(TALLY)
S/S GND
S/S 5V
FADER
EVF W
AUDIO GND
AUDIO 5V
ME/UN(MP)
JOG VD
COMP SYNC
UN(SYSTEM RESET)
UN(COSMO SCK)
COSMO SO
VIDEO GND
VIDEO 5V
UN(AUDIO STB)
UN(VIDEO CS)
RF SWP
SP/UN(LP)
UN(REC LED)
UN(DEW LED)
TO VS-37 BOARD(3/3) (SS)
(See Page 192)
DOC PULSE
JOG
SP/UN(LP)
REC AFM RF
REC C RF
REC Y RF
PB RF
RF GND
VIDEO GND
VIDEO 5V
TO VS-37 BOARD(1/3) (RP.FE)
(See Page 168)
(G-16)(G-16)(H-16)
Q201,202,203
CURRENT LIMITER
IC201 (I-17)
CXA1201Q
Y/C PROCESS
DUS DECODER
CLAMP
AGC OFF
DOC PULSE
SYNC OUT
SYNC SEP
PULSE GEN
REG1.2V
AGC DET
REC VIDEO OUT
REC LEVEL
PB IN
PB LEVEL
RF MOD
VIDEO OUT
VCC
Q204(H-16)
AGC DISCHARGE
Q270(H-16)
CAM Y BUFFER
RV201 47K <REC AGC>
SYNC AGC
Q205 VIDEO BUFFER
Q230(J-11)
EVF CHARACTER MIX
(J-19)(J-18)
Q215,216
CHROMA AMP
Q234(F-17) Q235
DELAY LPF
Q259(J-7)
SWITCH
Q231(I-10)
SWITCH
(I-11)
Q232
SWITCH
Q233(F-12)
BUFFER
Q250(G-11)
JOG SWITCH
(J-23)
Q256
SWITCH
Q236(F-12)
SWITCH
(D-22)(D-9) (E-5)(D-24)(D-23) (D-7)
Q237,238 Q239 Q271,272 Q252
REC Y EQ BUFFER HALF TRAP SWITCH LINE REC Y BUFFER
(G-17) (F-18)
Q241 Q253
REC C BUFFER LINE REC C BUFFER
(G-12)(G-12)(G-12)
Q242,243,244
SWITCH
Q255(I-22)
SWITCH
(TP212 CHECK LAND)
(TP207 CHECK LAND)
IC205 (I-22)
MC14094BF
EXPANTION PORT
Q254(I-7)
INVERTER
IC204
CXA1203N
JOG CHROMA PROCESS


IC201 (I-17)
CXA1201Q
Y/C PROCESS
DUS DECODER
CLAMP
REG1.2V
PULSE GEN
SYNC SEP
AGC OFF
DOC PULSE
SYNC OUT
AGC DET
REC VIDEO OUT
VCC
REC LEVEL
PB IN
PB LEVEL
RF MOD
VIDEO OUT
Q205 (I-13)
VIDEO BUFFER
(I-19) Q206 INVERTER
(I-19) Q226 SWITCH
Q207 (I-10) SWITCH
(J-19)(J-18) Q215,216 CHROMA AMP
D202 (I-18) MA110
Q234 (F-17) DELAY
(F-18) Q235 LPF
Q233 (F-12) BUFFER
Q245 (D-7) SOFT LIMITER
Q246 (D-21) LPF
Q248 (D-9) CUT-OFF FREQ SW
Q249 (D-21) SWITCH
Q250 (G-11) JOG SWITCH
(E-23) Q227 BUFFER
(E-20) Q228 PB VIDEO BUFFER
IC203 (G-22)
CXA1200Q
Y/C PROCESS
(D-22)(D-9) Q237,238 REC Y EQ
(E-5) Q239 BUFFER
(D-24)(D-23) Q271,272 HALF TRAP SWITCH
(D-7) Q252 LINE REC Y BUFFER
(G-17) Q241 REC C BUFFER
(F-18) Q253 LINE REC C BUFFER
(G-12)(G-12)(G-12) Q242,243,244 SWITCH
IC204 CXA1203N JOG CHROMA PROCESS
(G-18)
FSC ADJ
LPF ADJ
AMP
MODE
PB
JOG
TH/DL
SEQUENCE DET
FREQ CONV
TH CHROMA
DL CHROMA
SWD1 1/2FH
-90° SHIFT
X 2
2FSC
PHASE SHIFT
LPF
APC DET
BFXCH TH/DL
QUASI BURST
1/2 FH MP
SWD 1/2 FH
FH VCO
AFC 10
MASK
HALF H KILLER
BF GENERATOR
BFXCH
Y/C SEP
NCTC IN
Y VCC
REC Y+C
CCDIO
LPF-1
LPF-2
LPF-3
DOC LPF
COMP IN
SHP OUT
EMP
NCSHP
PB Y+C OUT
PB C IN
Y GND
REC Y RF
PB Y RF
APC ADJ
C GND
CF1
C VCC
LIM
BPF
DEMOD
EQ
MOD
MODEM
AFC DET
APC ID
DC F.B.
VCO
ACK
BID
APC DET
SYNC DET
ACC DET
AFPC
BF.GEN.
PI/PS
VXO
CONV
VXO/XO
INV.
BURST DEEMP
PB CONV.
ACC
BURST EMP
C-EMP
REC CONV.
SECAM
PAL ONLY SECAM
CMAIN
FL203 CF
IC203 CXA1200Q
FL201 C.BPF
FL202 C.TRAP
<CROMA EMPHA>
<PB C.TRAP>
Q209 DTC144EU
Q251 (G-19) SWITCH
Q229 (G-20) INVERTER
Q208 (F-20) CHROMA ATT
Q209 (F-21) TRAP FREQ SW


13
14
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16
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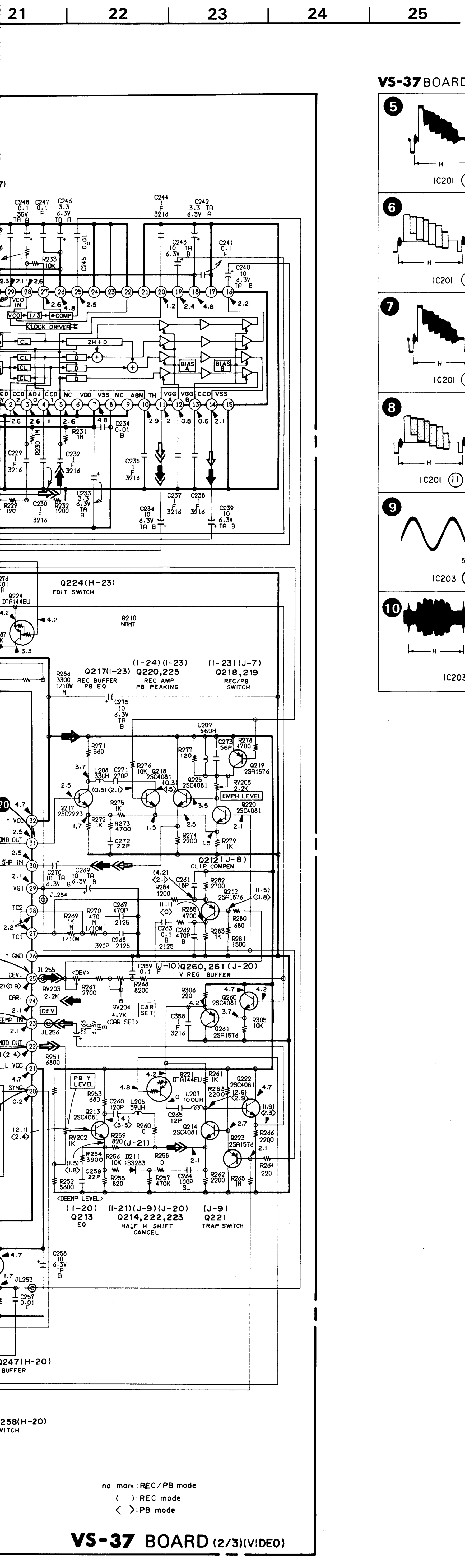
24
IC202 (G-7)
CXL1502M
CCD COMB FILTER
Q207(I-10)
SWITCH
IC203 (G-22)
CXA1200Q
Y/C PROCESS
(E-23) Q227 BUFFER
(E-20) Q228 PB VIDEO BUFFER
Q224(H-23)
EDIT SWITCH
(I-19) Q206 INVERTER
(I-19) Q226 SWITCH
Q248(D-9) CUT-OFF FREQ SW
Q249(D-21) SWITCH
Q217(I-23) REC BUFFER PB EQ
(I-24)(I-23) Q220,225 REC AMP PB PEAKING
(I-23)(J-7) Q218,219 REC/PB SWITCH
Q212(J-8) CLIP COMPEN
(J-10)Q260,261(J-20) V REG BUFFER
(I-20) Q213 EQ
(I-21)(J-9)(J-20) Q214,222,223 HALF H SHIFT CANCEL
(J-9) Q221 TRAP SWITCH
Q247(H-20) FSC BUFFER
Q258(H-20) SWITCH
Q251(G-19) SWITCH
Q229(G-20) INVERTER
Q208(F-20) CHROMA ATT
Q209(F-21) TRAP FREQ SW
CCD10
CCDFL
NCSHP
SSAGC
MODEM
EMPHA
AFPC
VXO
CMAIN
LOGIC
TH CHROMA
DL CHROMA
HALF H KILLER
BF GENERATOR
MASK
C.BPF
C.TRAP
<CROMA EMPHA>
<PB C.TRAP>
X201 4.43MHZ
CCIR PAL
ENC
UN(TRANS)
UN(PAL ONLY)
AFCH
VEM
CFLL
CFLH
NCL2
NCL1
SLFC
SECAM
CCIR 443
EDIT
JOG
PB

no mark : REC/PB mode
( ) : REC mode
〈 〉 : PB mode

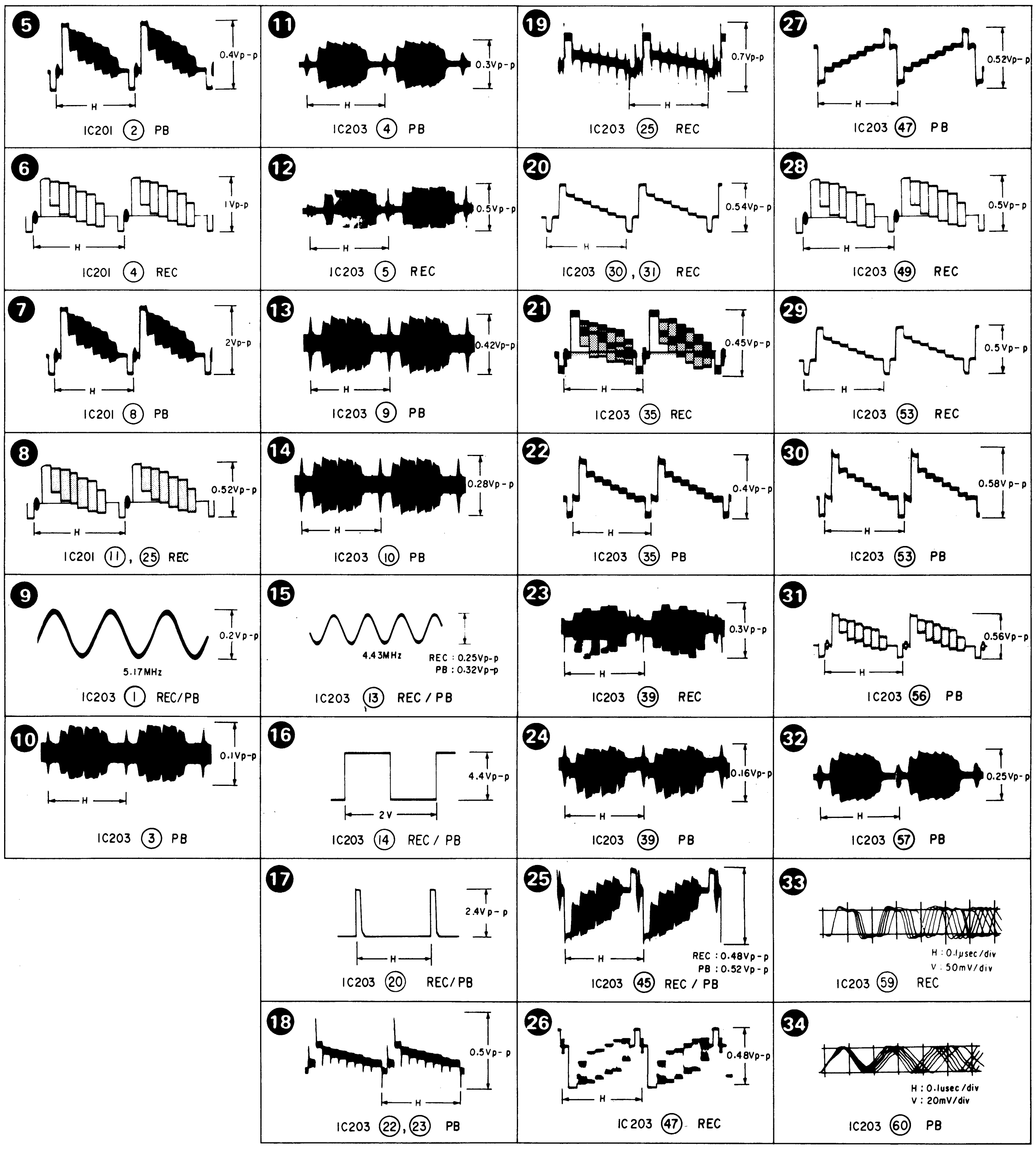
VS-37 BOARD (2/3)(VIDEO)


21
22
23
24
25
Q224(H-23)
EDIT SWITCH
Q210
NMHT
(I-24)(I-23)
(I-23)(J-7)
Q217(I-23) Q220,225 Q218,219
REC BUFFER PB EQ
REC AMP PB PEAKING
REC/PB SWITCH
CLOCK DRIVER
BIAS A
BIAS B
EMPH LEVEL
Q212(J-8)
CLIP COMPEN
Q260,261(J-20)
V REG BUFFER
CAR SET
DEV
PB Y LEVEL
<DEEMP LEVEL>
(I-20) (I-21)(J-9)(J-20) (J-9)
Q213 Q214,222,223 Q221
EQ
HALF H SHIFT CANCEL
TRAP SWITCH
Q247(H-20)
BUFFER
Q258(H-20)
SWITCH

no mark : REC / PB mode
( ) : REC mode
< > : PB mode

VS-37 BOARD (2/3)(VIDEO)

VS-37 BOARD (VIDEO)



- **For schematic diagrams.**
- The code shown like (C-9) for each semiconductor indicates the position of location address on the printed wiring board.

- Signal path

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC	➡	➠	➡»	➡
PB	⇨	⇨	⇨»	⇨

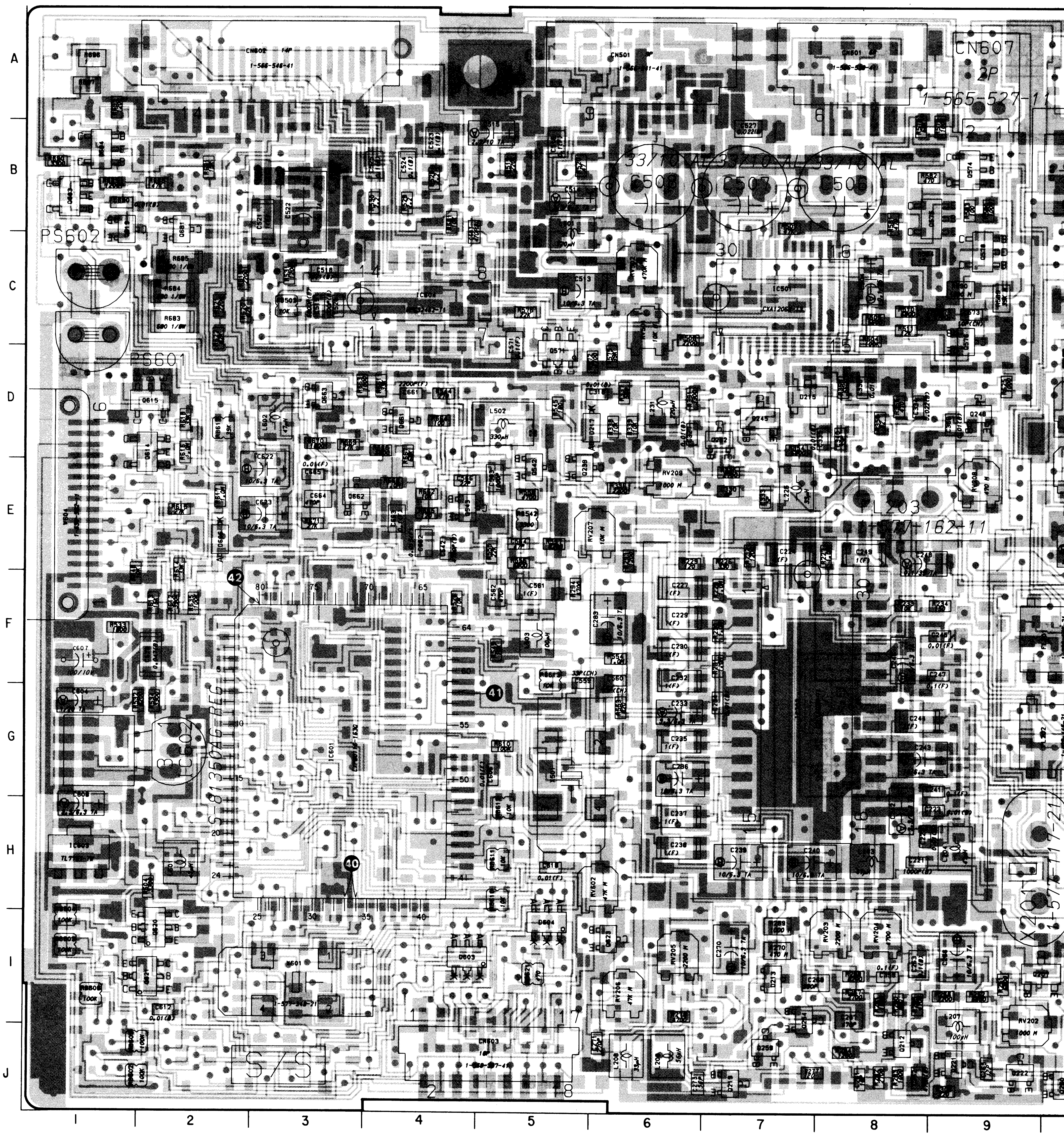
VS-37 (HEAD AMP, VIDEO, SERVO/SYSTEM CONTROL) PRINTED WIRING BOARDS

— Ref. No. VS-37 BOARD: 5000 series —

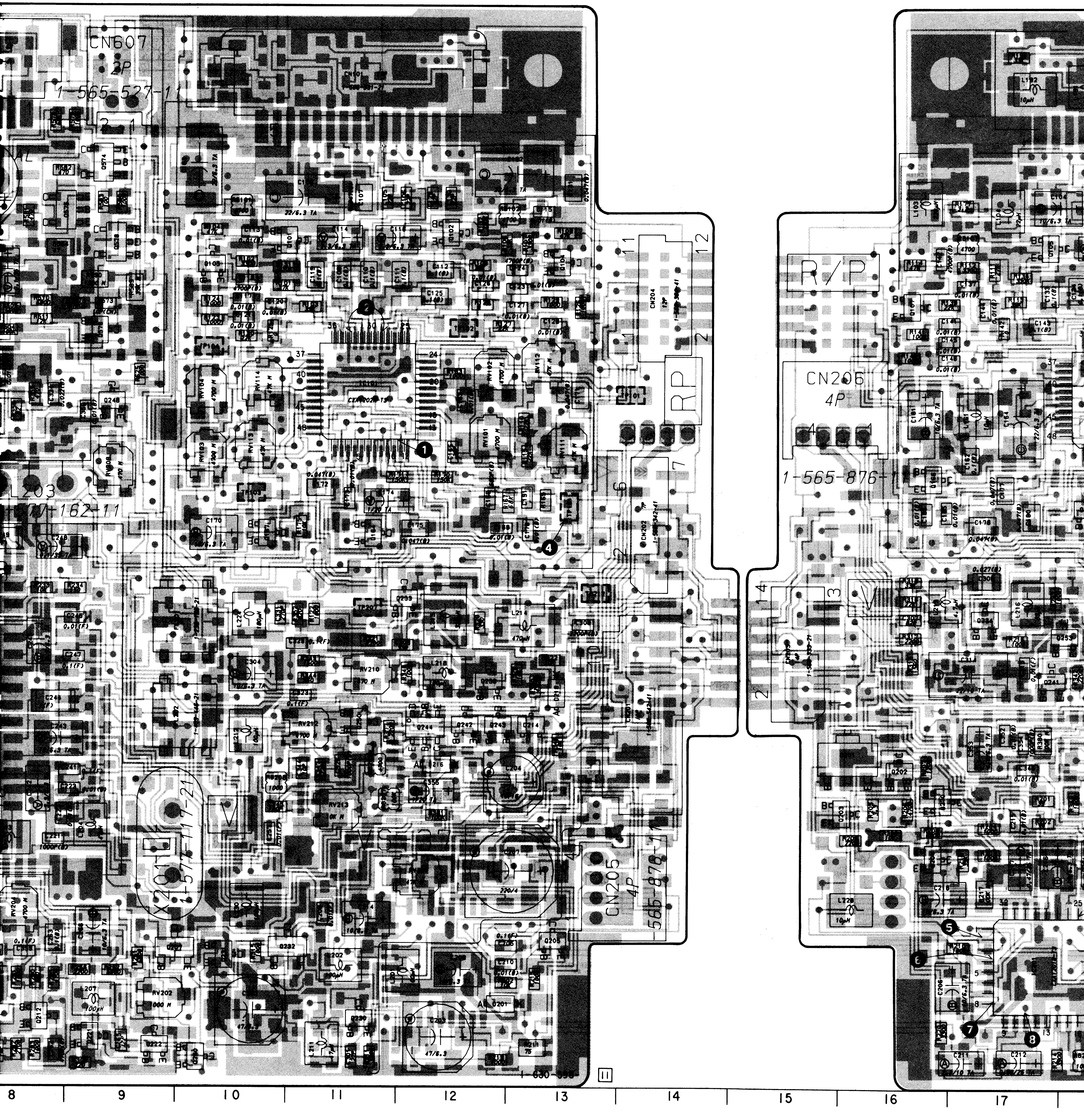
- **For printed wiring boards.**
- VS-37 board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- Through hole (⊗) is omitted.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the pattern face are indicated.

VS-37 BOARD (COMPONENT SIDE)


A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
9
CN602 14P
1-566-546-41
CN501
CN607
2P
1-565-527-11
C508
C507
C506
PS602
PS601
IC501
CXA1205
IC601
L502
L203
CN603
S/S
X201
42
41
40

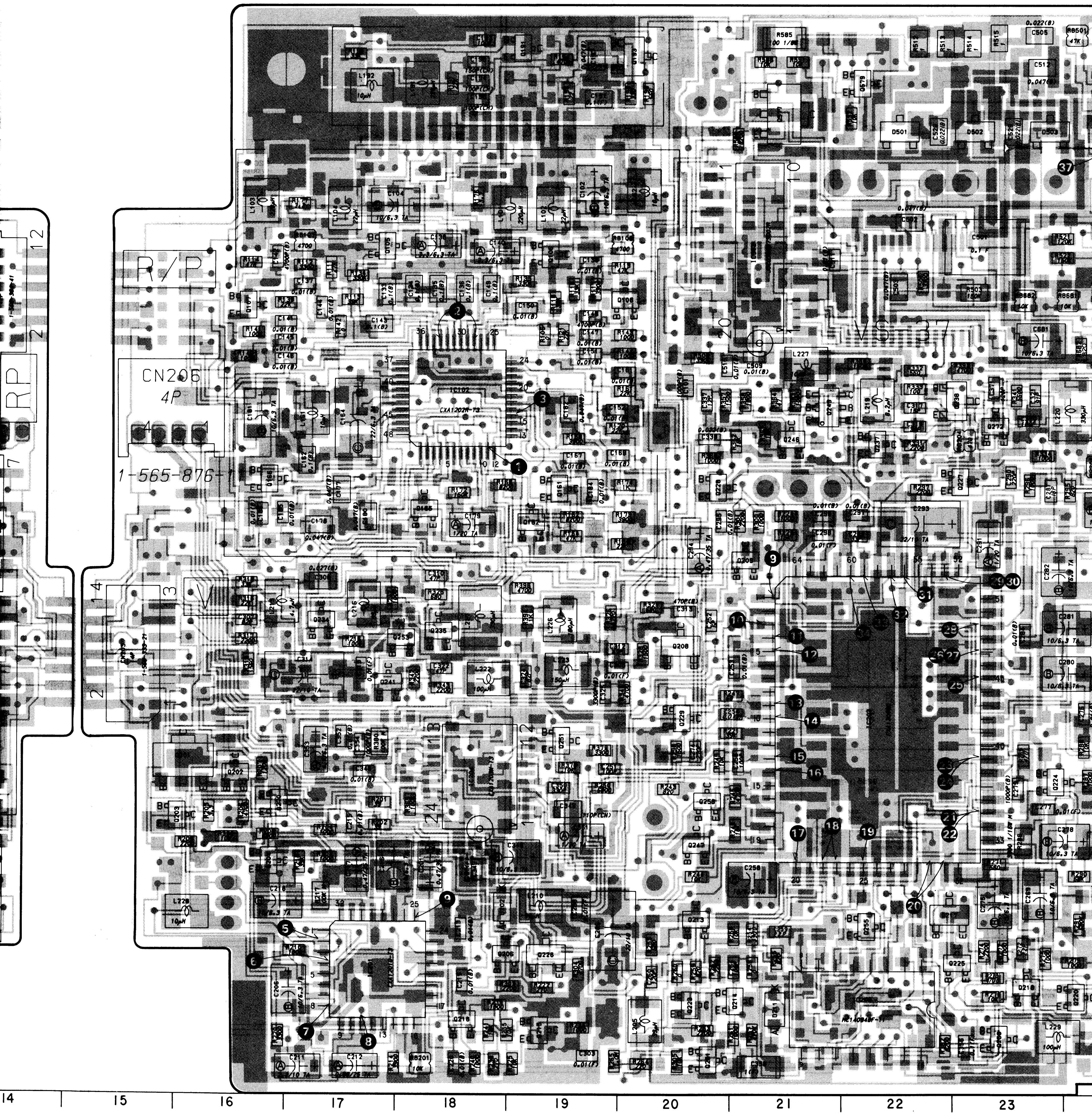
VS-37 BOARD (CONDUCTOR SIDE)


CN607
2P
1-565-527-11
CN204
12P
RP
R/P
CN206
4P
1-565-876-11
CN202
IC101
CXA1202Q-T5
L203
X201
1-577-117-21
CN205
4P
1-565-876-11
1-630-356
8
9
10
11
12
13
14
15
16
17

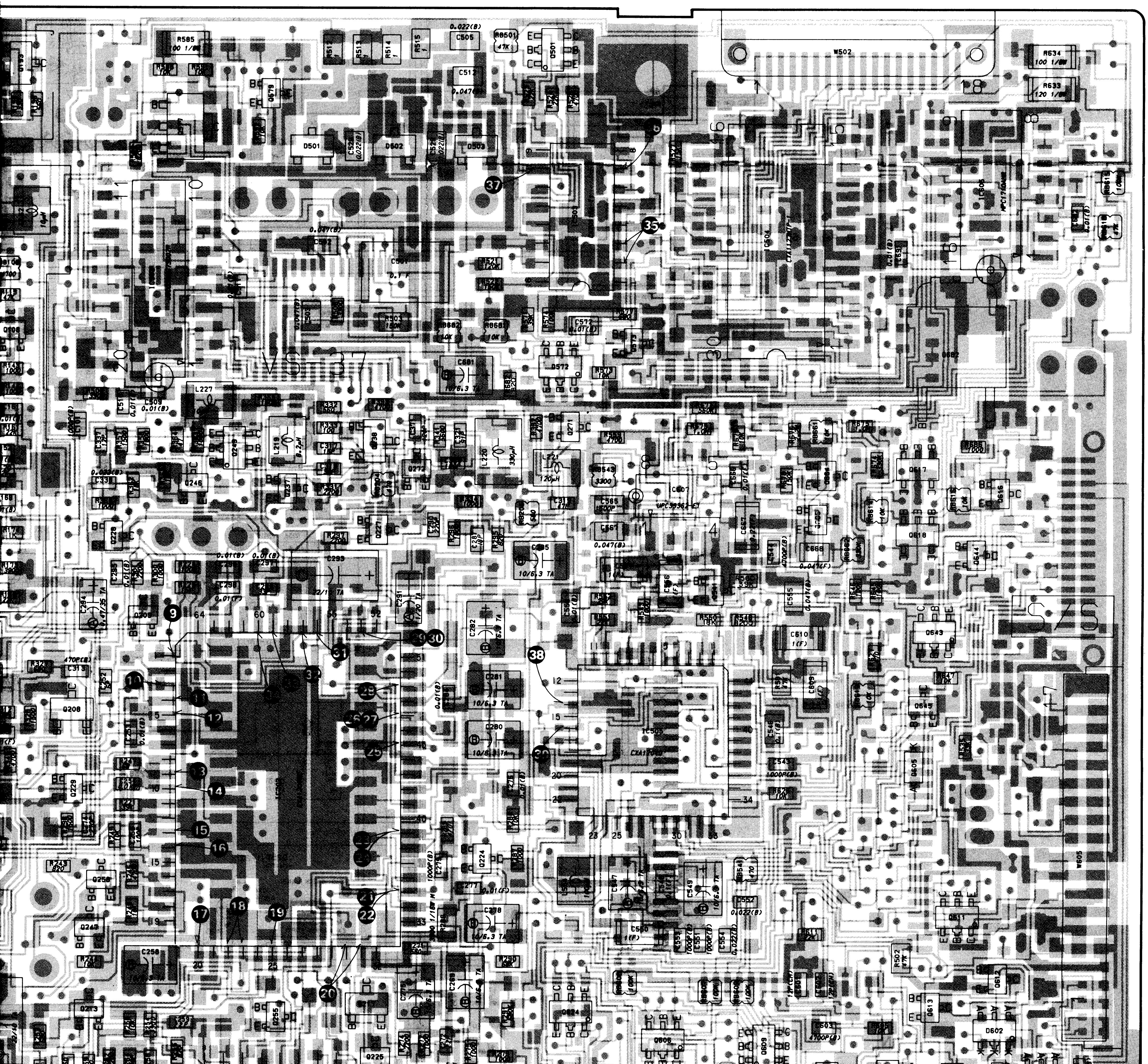
SERVO/SYSTEM CONTROL

SERVO/SYSTEM CONTROL

VS-37 BOARD (CONDUCTOR SIDE)



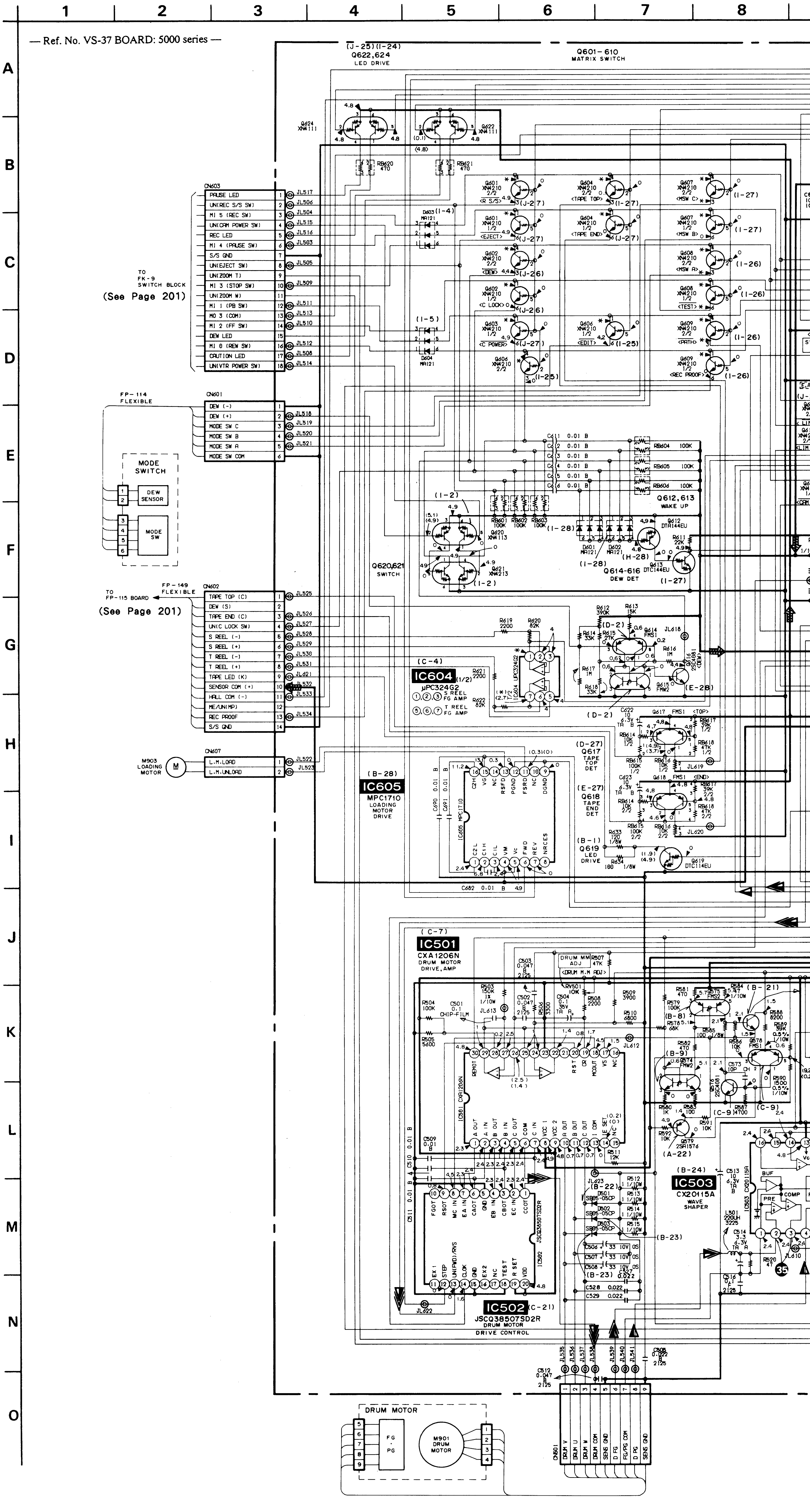
R/P
CN206
4P
1-565-876-11
CXA1202R-T3
IC102
VS-37
L227
C505
R585
D501
D502
D503
14
15
16
17
18
19
20
21
22
23


1-630-598-
11
E Australian MODEL
W502
W605
IC505

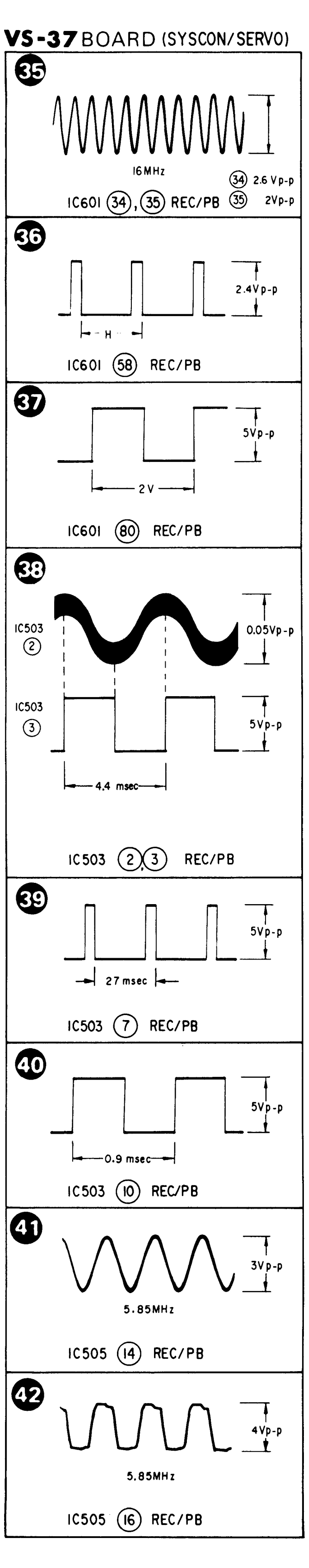
20 21 22 23 24 25 26 27 28

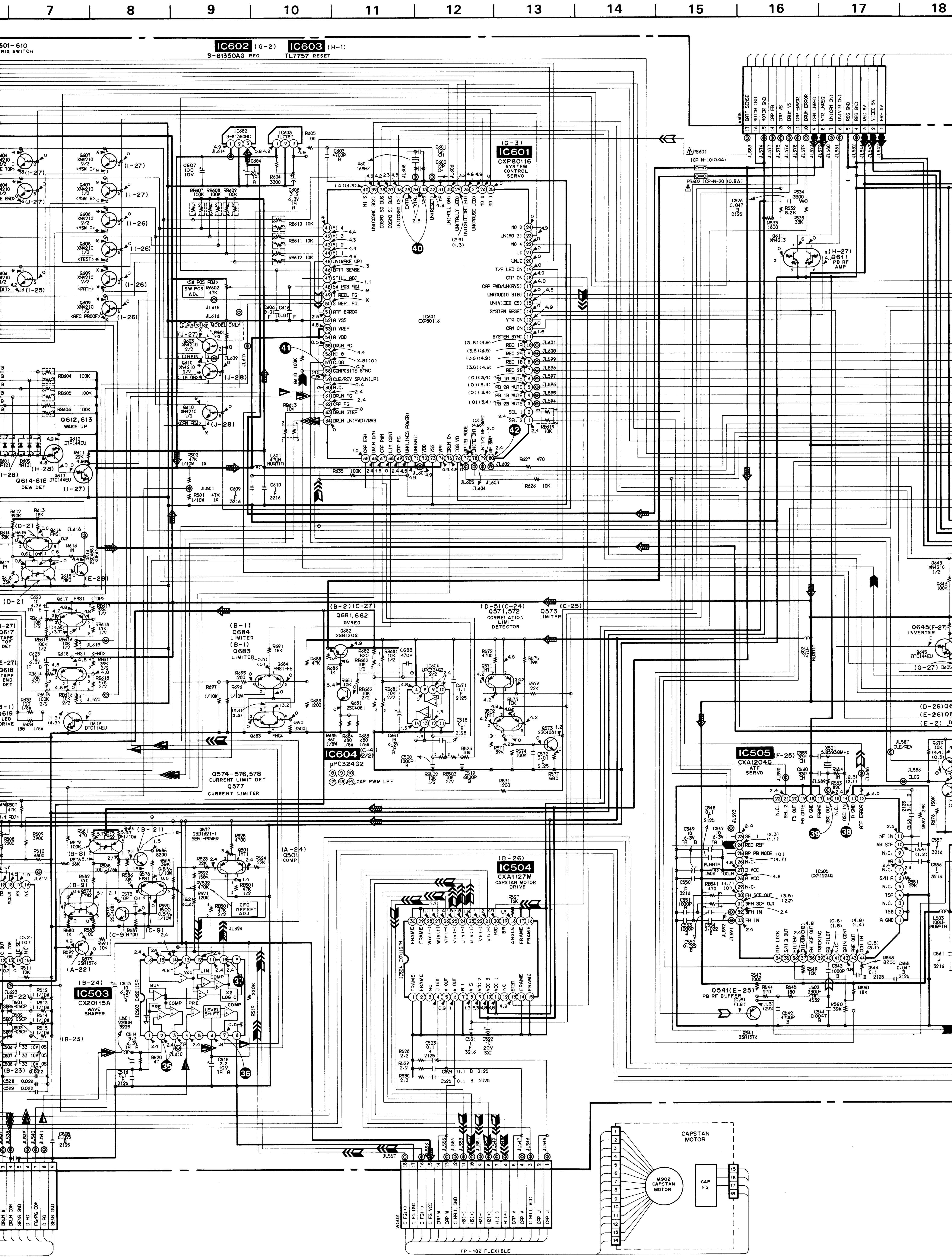
VS-37 (SERVO/SYSTEM CONTROL) SCHEMATIC DIAGRAMS

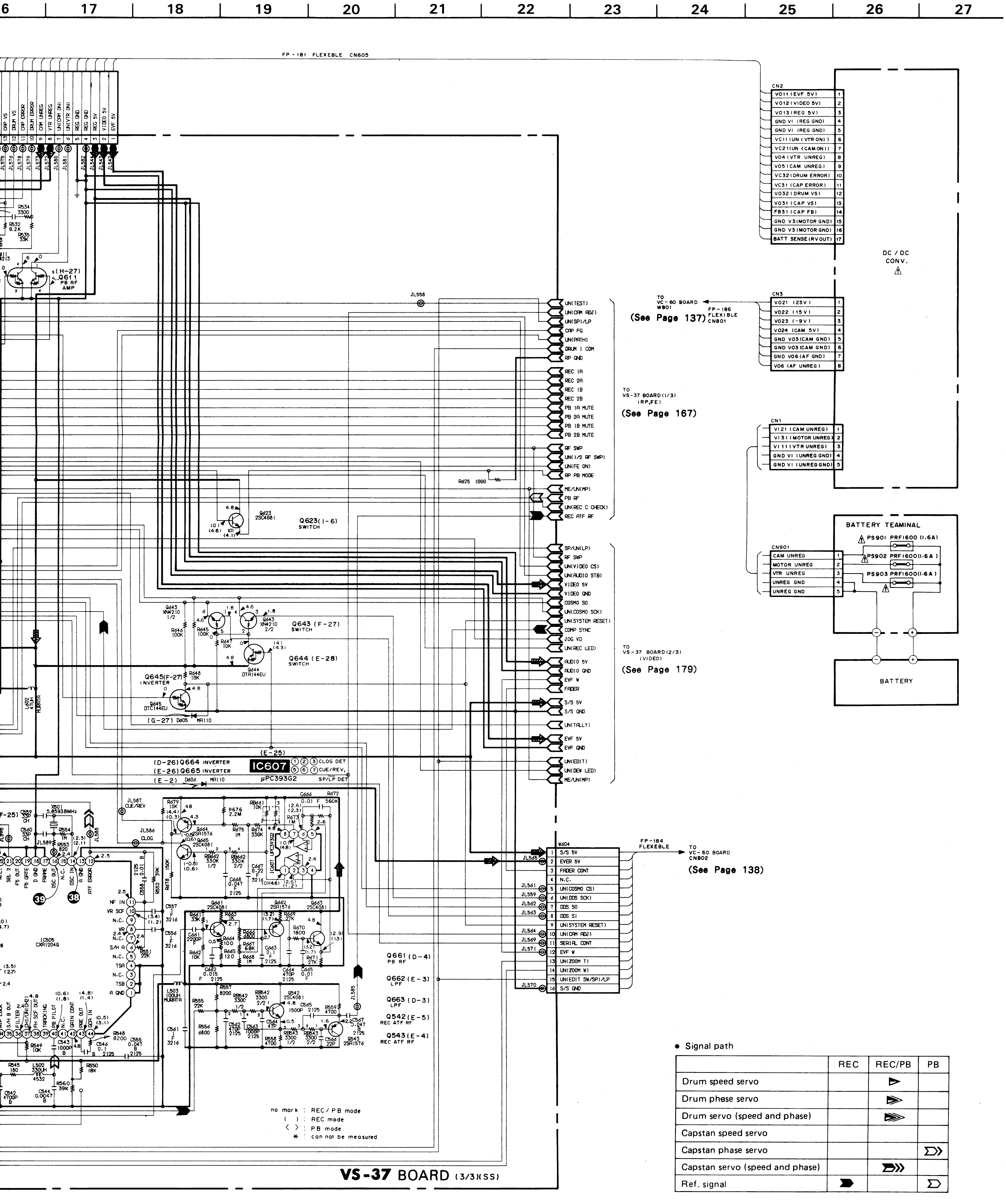
— Ref. No. VS-37 BOARD: 5000 series —



1
2
3
4
5
6
7
8
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
(J-25)(I-24) Q622,624 LED DRIVE
Q601-610 MATRIX SWITCH
Q624 XN4111
Q622 XN4111
RB620 470
RB621 470
D603 (I-4) MA121
D604 MA121
CN603
PAUSE LED
UN(REC S/S SW)
MI 5 (REC SW)
UN(CAM POWER SW)
REC LED
MI 4 (PAUSE SW)
S/S GND
UN(EJECT SW)
UN(ZOOM T)
MI 3 (STOP SW)
UN(ZOOM W)
MI 1 (PB SW)
MO 3 (COM)
MI 2 (FF SW)
DEW LED
MI 0 (REW SW)
CAUTION LED
UN(VTR POWER SW)
TO FK-9 SWITCH BLOCK
(See Page 201)
FP-114 FLEXIBLE
CN601
DEW (-)
DEW (+)
MODE SW C
MODE SW B
MODE SW A
MODE SW COM
MODE SWITCH
DEW SENSOR
MODE SW
TO FP-115 BOARD
FP-149 FLEXIBLE
(See Page 201)
CN602
TAPE TOP (C)
DEW (S)
TAPE END (C)
UN(C LOCK SW)
S REEL (-)
S REEL (+)
T REEL (-)
T REEL (+)
TAPE LED (K)
SENSOR COM (+)
HALL COM (-)
ME/UN(MP)
REC PROOF
S/S GND
CN607
L.M.LOAD
L.M.UNLOAD
M903 LOADING MOTOR
<R S/S>
<EJECT>
<DEW>
<C LOCK>
<C POWER>
<TAPE TOP>
<TAPE END>
<EDIT>
<MSW C>
<MSW B>
<MSW A>
<TEST>
<PATH>
<REC PROOF>
Q612,613 WAKE UP
Q620,621 SWITCH
Q614-616 DEW DET
IC604 μPC324G2
①②③ S REEL FG AMP
⑤⑥⑦ T REEL FG AMP
IC605 MPC1710 LOADING MOTOR DRIVE
Q617 TAPE TOP DET
Q618 TAPE END DET
Q619 LED DRIVE
IC501 CXA1206N DRUM MOTOR DRIVE, AMP
IC502 JSCQ38507SD2R DRUM MOTOR DRIVE CONTROL
IC503 CX20115A WAVE SHAPER
DRUM MM ADJ
CN501
DRUM V
DRUM U
DRUM W
DRUM COM
SENS GND
D FG
FG/PG COM
D PG
SENS GND
DRUM MOTOR
FG PG
M901 DRUM MOTOR




7
8
9
10
11
12
13
14
15
16
17
18
IC602 (G-2) S-81350AG REG
IC603 (H-1) TL7757 RESET
IC601 (G-3) CXP80116 SYSTEM CONTROL SERVO
Q612,613 WAKE UP
Q614-616 DEW DET
Q617 TAPE TOP DET
Q618 TAPE END DET
Q619 LED DRIVE
Q684 LIMITER
Q683 LIMITER
Q681,682 5VREG
IC604 (C-4) µPC324G2 ⑧⑨⑩, ⑫⑬⑭ CAP PWM LPF
Q571,572 CORRELATION LIMIT DETECTOR
Q573 LIMITER
Q574-576,578 CURRENT LIMIT DET
Q577 CURRENT LIMITER
Q501 COMP
Q577 2SD1621-T SEMI-POWER
IC504 (B-26) CXA1127M CAPSTAN MOTOR DRIVE
IC503 (B-24) CX20115A WAVE SHAPER
IC505 (F-25) CXA1204Q ATF SERVO
Q541 (E-25) PB RF BUFFER
Q611 (H-27) PB RF AMP
Q645 (F-27) INVERTER
PS601 ICP-N-10 (0.4A)
PS602 ICP-N-20 (0.8A)
W405
BATT SENSE
MOTOR GND
MOTOR GND
CAP FB
CAP VS
DRUM VS
CAP ERROR
DRUM ERROR
CAM UNREG
VTR UNREG
UN(CAM ON)
UN(VTR ON)
REG GND
REG GND
REG 5V
VIDEO 5V
EVF 5V
W502
C FG(+)
C FG GND
C FG GND
C FG VCC
CAP W
CAP W
H3(-)
H3(+)
H2(-)
H2(+)
H1(-)
H1(+)
CAP V
CAP V
C HALL VCC
CAP U
CAP U
DRUM W
DRUM COM
SENS GND
D FG
FG/PG COM
SENS GND
CAPSTAN MOTOR
M902 CAPSTAN MOTOR
CAP FG
FP-182 FLEXIBLE
35
36
37
38
39
40
41
42


6
17
18
19
20
21
22
23
24
25
26
27
FP-181 FLEXEBLE CN605
Q611 (H-27) PB RF AMP
CN2
VO11 (EVF 5V) 1
VO12 (VIDEO 5V) 2
VO13 (REG 5V) 3
GND VI (REG GND) 4
GND VI (REG GND) 5
VC11 (UN (VTR ON)) 6
VC21 (UN (CAM ON)) 7
VO4 (VTR UNREG) 8
VO5 (CAM UNREG) 9
VC32 (DRUM ERROR) 10
VC31 (CAP ERROR) 11
VO32 (DRUM VS) 12
VO31 (CAP VS) 13
FB31 (CAP FB) 14
GND V3 (MOTOR GND) 15
GND V3 (MOTOR GND) 16
BATT SENSE (RVOUT) 17
DC / DC CONV.
CN3
VO21 (23V) 1
VO22 (15V) 2
VO23 (-9V) 3
VO24 (CAM 5V) 4
GND VO3 (CAM GND) 5
GND VO3 (CAM GND) 6
GND VO6 (AF GND) 7
VO6 (AF UNREG) 8
CN1
VI21 (CAM UNREG) 1
VI31 (MOTOR UNREG) 2
VI11 (VTR UNREG) 3
GND VI (UNREG GND) 4
GND VI (UNREG GND) 5
BATTERY TEAMINAL
PS901 PRF1600 (1.6A)
PS902 PRF1600 (1.6A)
PS903 PRF1600 (1.6A)
CN901
CAM UNREG 1
MOTOR UNREG 2
VTR UNREG 3
UNREG GND 4
UNREG GND 5
BATTERY
TO VC-60 BOARD W801
FP-186 FLEXIBLE CN801
(See Page 137)
UN(TEST)
UN(CAM ADJ)
UN(SP)/LP
CAP FG
UN(PATH)
DRUM 1 COM
RP GND
REC 1A
REC 2A
REC 1B
REC 2B
PB 1A MUTE
PB 2A MUTE
PB 1B MUTE
PB 2B MUTE
RF SWP
UN(1/2 RF SWP)
UN(FE ON)
RP PB MODE
ME/UN(MP)
PB RF
UN(REC C CHECK)
REC ATF RF
TO VS-37 BOARD (1/3) (RP,FE)
(See Page 167)
SP/UN(LP)
RF SWP
UN(VIDEO CS)
UN(AUDIO STB)
VIDEO 5V
VIDEO GND
COSMO SO
UN(COSMO SCK)
UN(SYSTEM RESET)
COMP SYNC
JOG VD
UN(REC LED)
AUDIO 5V
AUDIO GND
EVF W
FADER
S/S 5V
S/S GND
UN(TALLY)
EVF 5V
EVF GND
UN(EDIT)
UN(DEW LED)
ME/UN(MP)
TO VS-37 BOARD (2/3) (VIDEO)
(See Page 179)
Q623 (I-6) SWITCH
Q643 (F-27) SWITCH
Q644 (E-28) SWITCH
Q645 (F-27) INVERTER
(G-27) D605 MA110
(D-26) Q664 INVERTER
(E-26) Q665 INVERTER
(E-2) D606 MA110
IC607 μPC393G2
①②③ CLOG DET
⑤⑥⑦ CUE/REV, SP/LP DET
JL587 CUE/REV
JL586 CLOG
IC505 CXA1204Q
W604
1 S/S 5V
2 EVER 5V
3 FADER CONT
4 N.C.
5 UN(COSMO CS)
6 UN(DDS SCK)
7 DDS SO
8 DDS SI
9 UN(SYSTEM RESET)
10 UN(CAM ADJ)
11 SERIAL CONT
12 EVF W
13 UN(ZOOM T)
14 UN(ZOOM W)
15 UN(EDIT SW/SP)/LP
16 S/S GND
FP-184 FLEXEBLE
TO VC-60 BOARD CN802
(See Page 138)
Q661 (D-4) PB RF
Q662 (E-3) LPF
Q663 (D-3) LPF
Q542 (E-5) REC ATF RF
Q543 (E-4) REC ATF RF
no mark : REC/PB mode
( ) : REC mode
〈 〉 : PB mode
* : can not be measured

VS-37 BOARD (3/3)(SS)

- Signal path

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷▷	
Drum servo (speed and phase)		▷▷▷	
Capstan speed servo			
Capstan phase servo			▷»
Capstan servo (speed and phase)		➡»	
Ref. signal	➤		▷

- **For schematic diagrams.**
  - The code shown like (C-9) for each semiconductor indicates the position of location address on the printed wiring board.

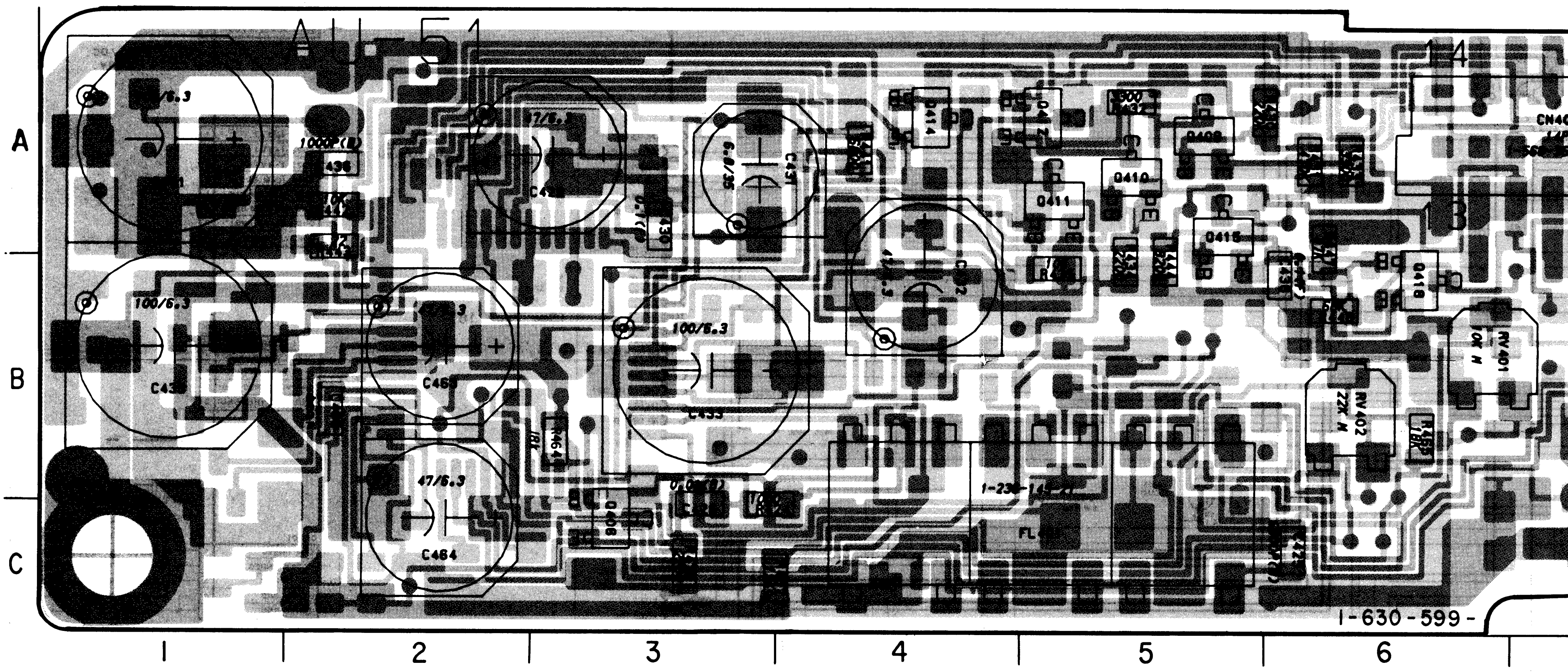
AU-51 (AUDIO), MA-32 (MIC AMP), EL-1 (REMOTE/EARPHONE JACK) PRINTED WIRING BOARDS

— Ref. No. AU-51 BOARD: 3000 series, MA-32 BOARD: 4000 series, EL-1 BOARD: 5000 series —

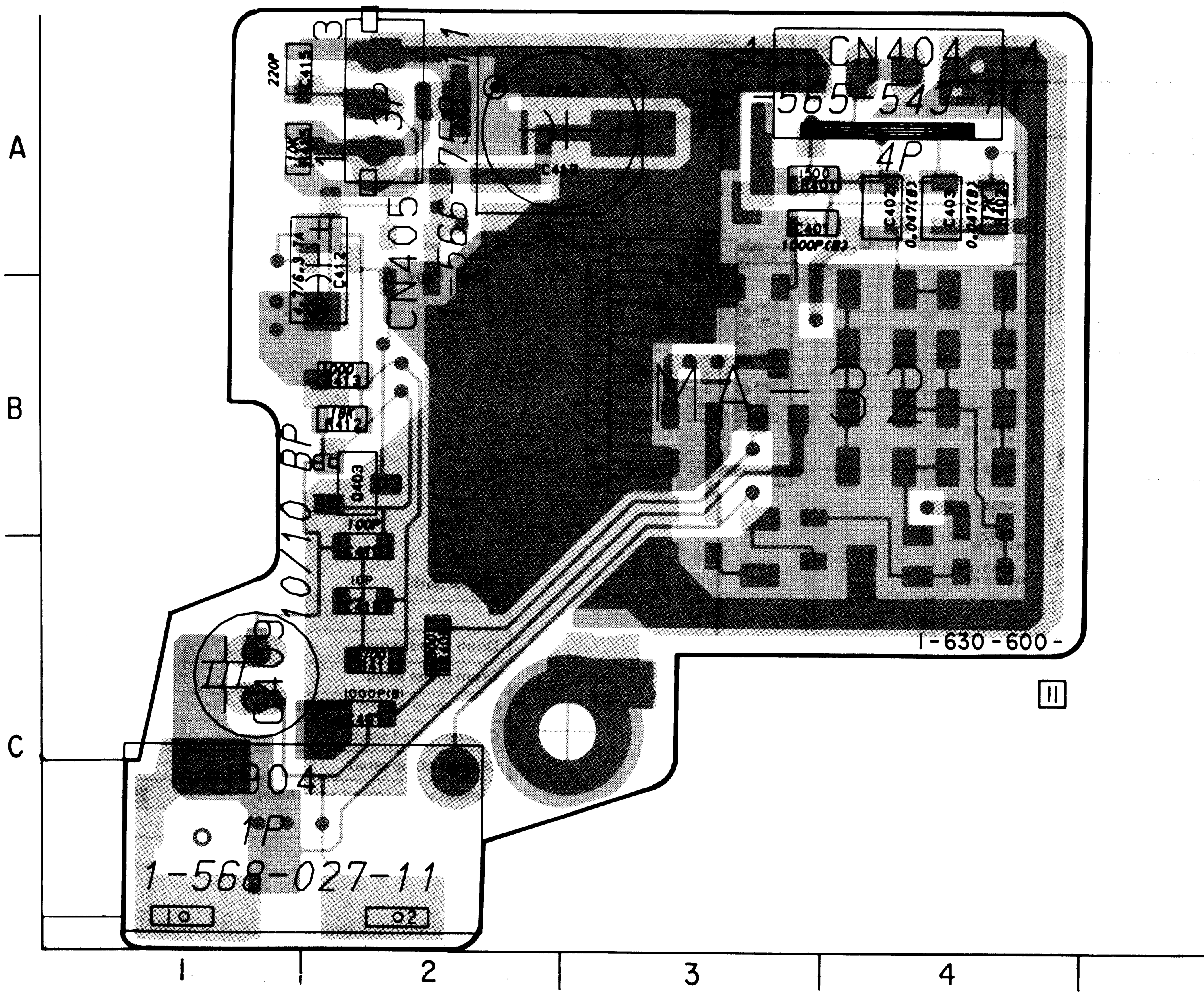
- **For printed wiring boards.**
- AU-51, MA-32 and EL-1 boards is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- Through hole (⊗) is omitted.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the pattern face are indicated.

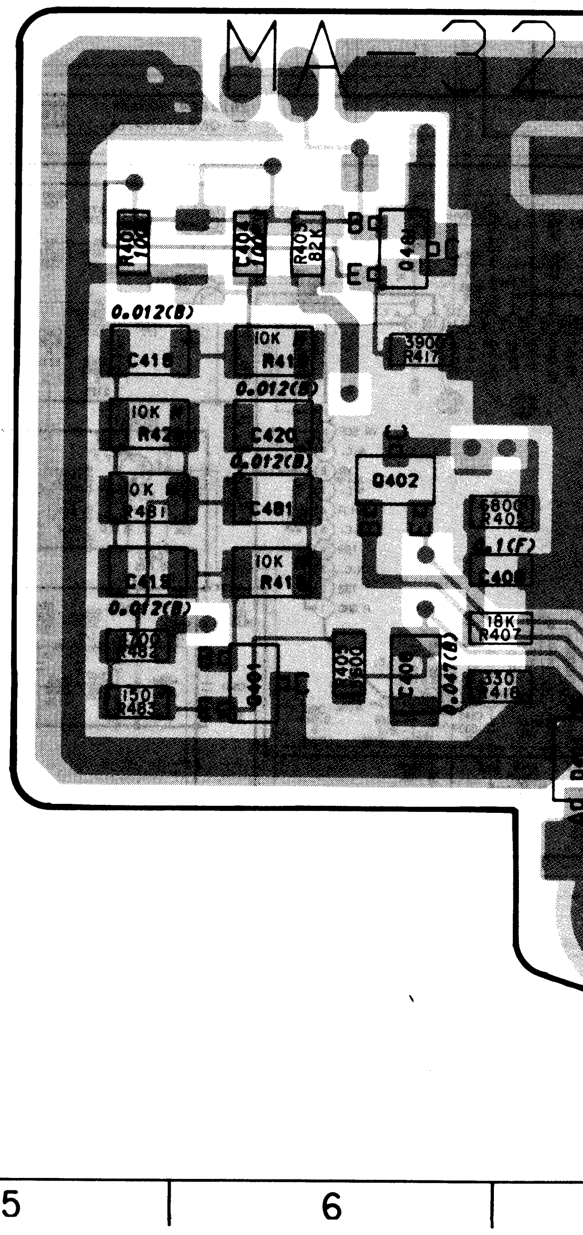
AU-51 BOARD (COMPONENT SIDE)


A
B
C
1
2
3
4
5
6
AU-51
1000P(B)
100/6.3
C43
C461
47/6.3
C464
C431
C432
100/6.3
C433
Q414
Q411
Q410
Q409
Q415
Q418
RV401
10K
RV402
22K
FL4
CN4
1-630-599-

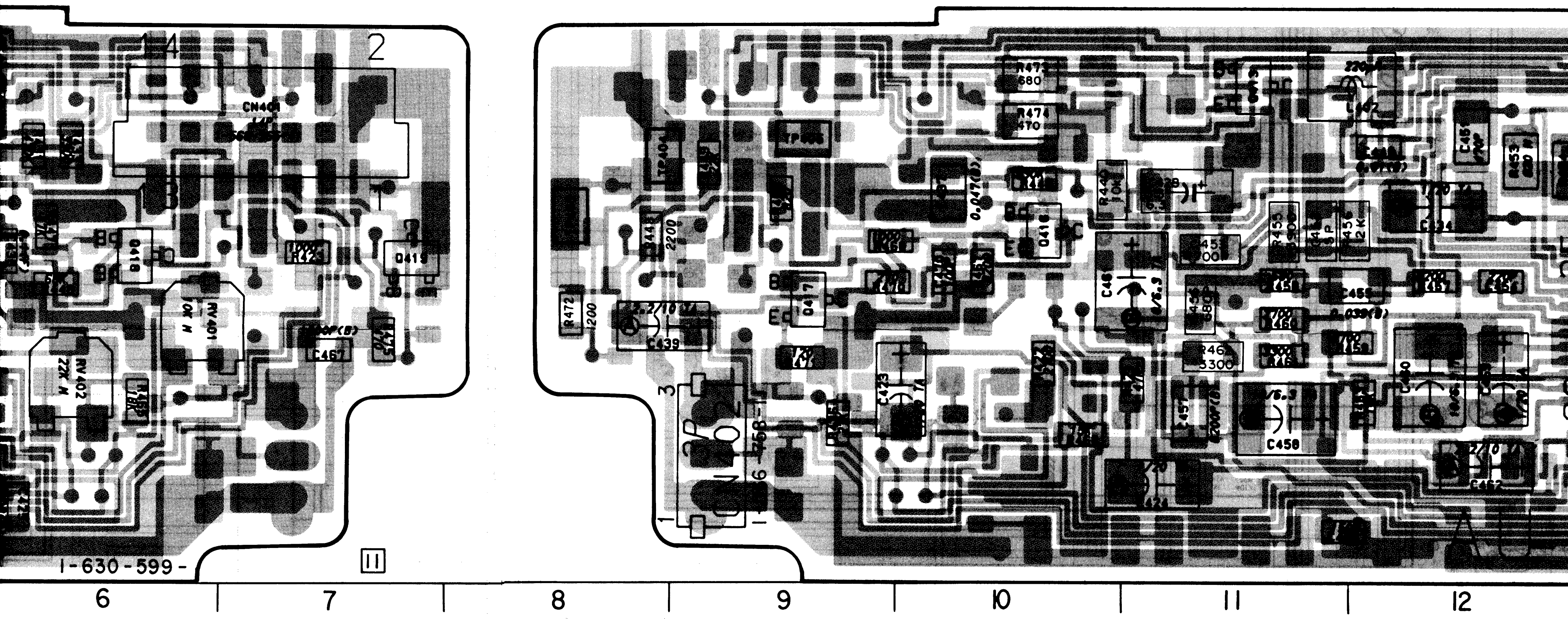
MA-32 BOARD (COMPONENT SIDE)


A
B
C
1
2
3
4
220P
C415
10K
4.7/6.3
C412
C413
CN405
1-565-750-11
3P
C411
CN404
1-565-543-11
4P
1500
R401
C401
1000P(B)
C402
0.047(B)
C403
Q403
100P
10P
1000P(B)
C409
10/10 BP
MA-32
1-630-600-
11
CN404
1P
1-568-027-11
1
2

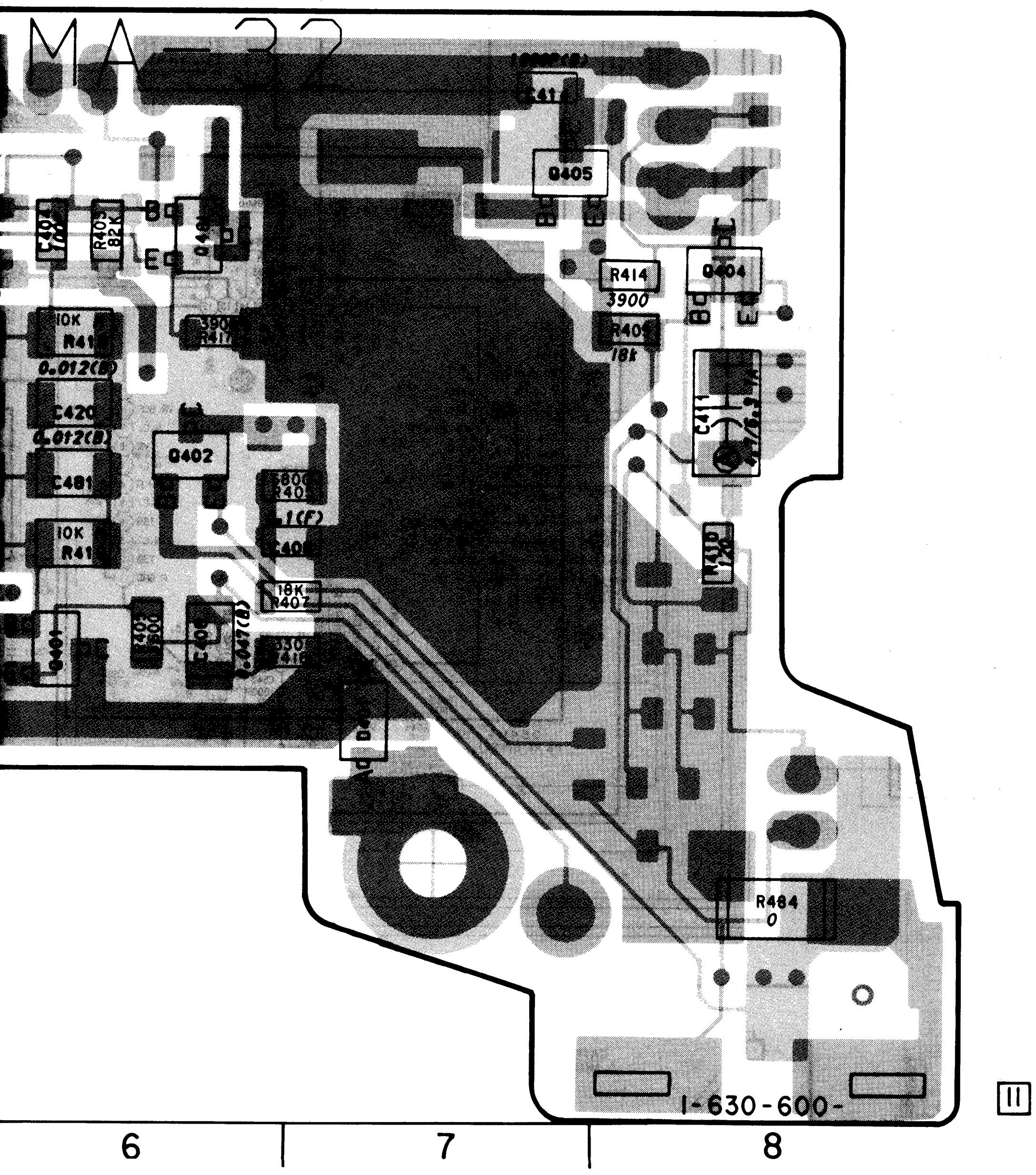
MA-32 BOARD (CONDUCTOR SIDE)


MA-32
0.012(B)
C418
10K
C420
Q402
C419
Q401
5
6

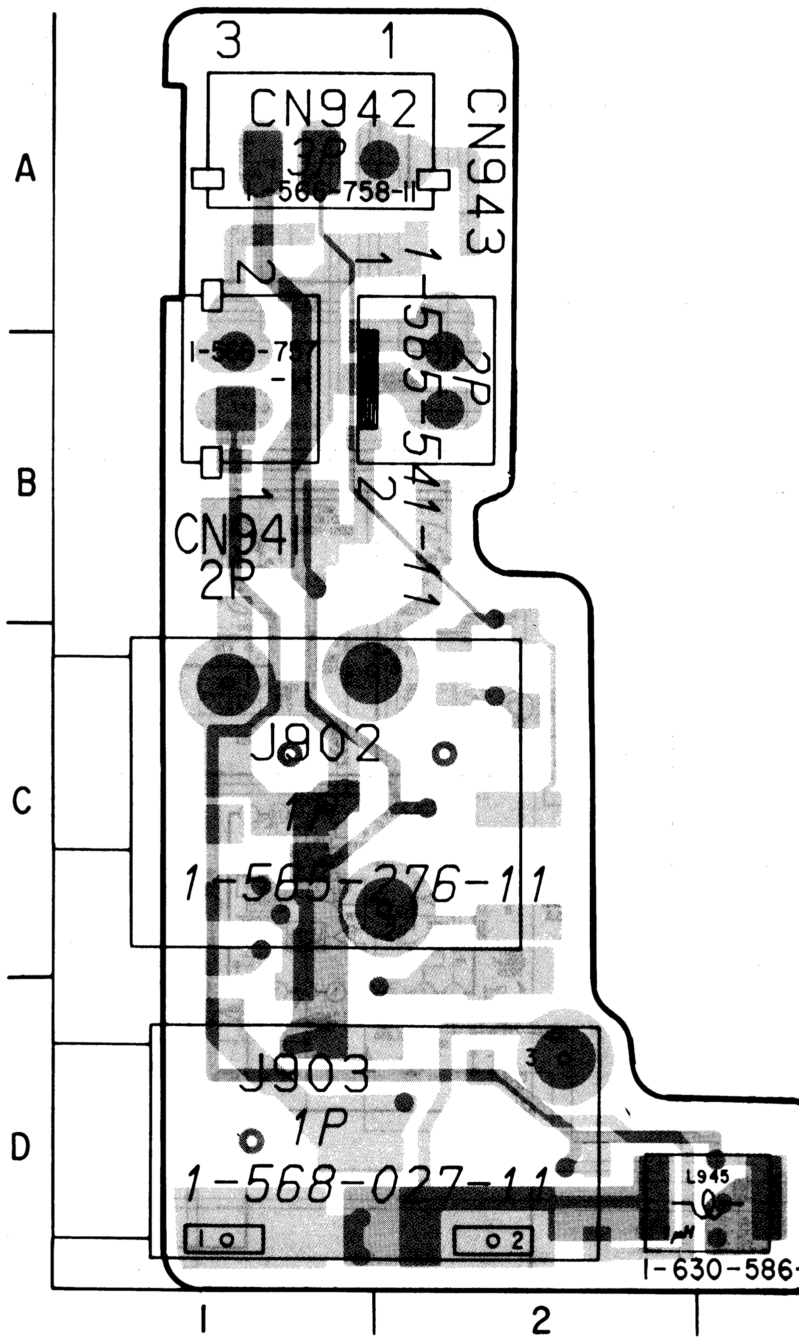
AU-51 BOARD (CONDUCTOR SIDE)


CN401
Q419
Q418
RV401
RV402
C467
1-630-599-
11
R472
C439
CN402
R473
R474
Q416
C456
C458
C452
C450
6
7
8
9
10
11
12

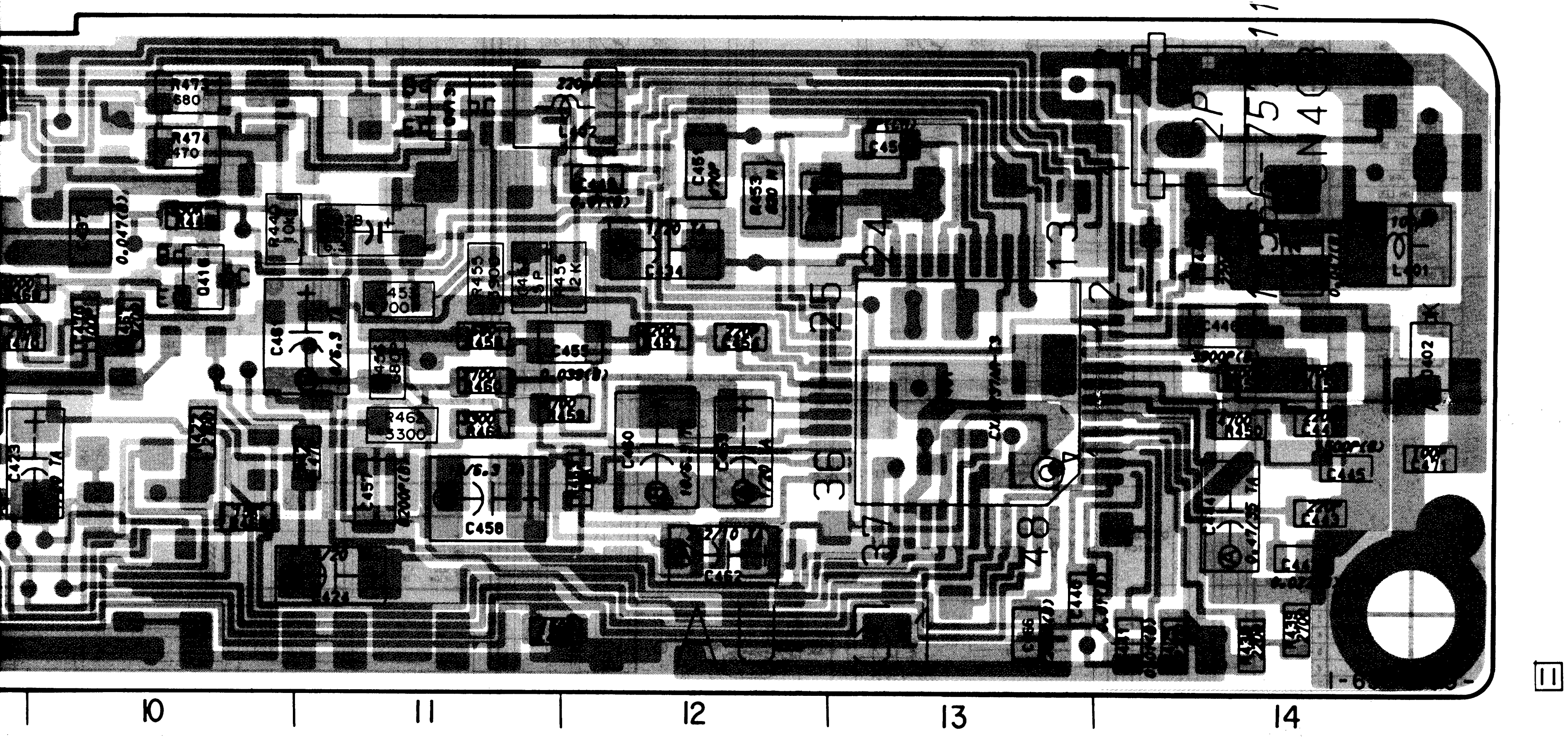
BOARD (CONDUCTOR SIDE)


MA-32
Q405
Q404
R414
3900
R410
120
C411
Q402
R484
0
1-630-600-
11
6
7
8

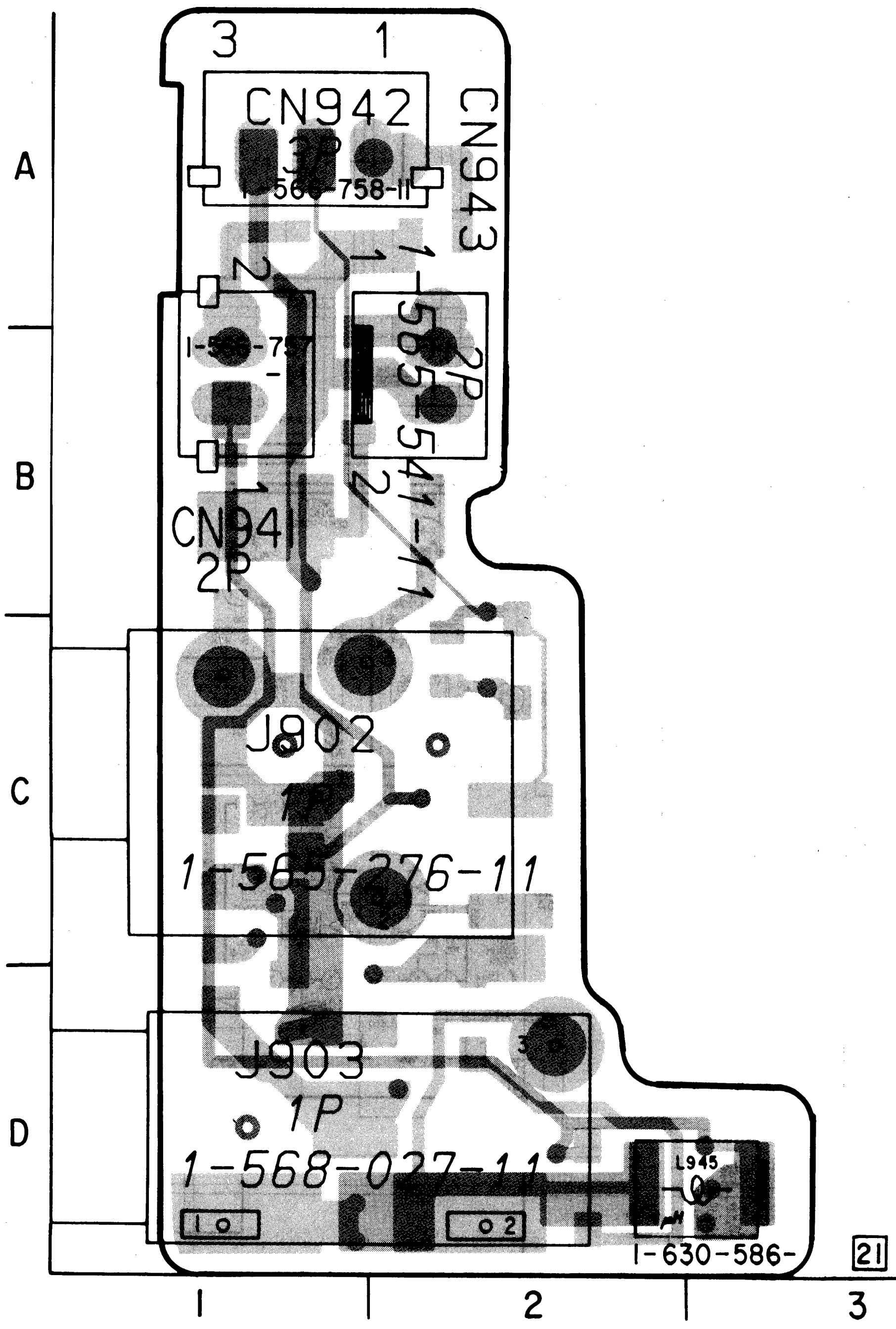
EL-1 BOARD (COMPONENT SIDE)


3
1
CN942
3P
1-566-758-11
CN943
1-565-541-11
2P
CN941
2P
J902
1-565-276-11
J903
1P
1-568-027-11
L945
1-630-586-
A
B
C
D
1
2

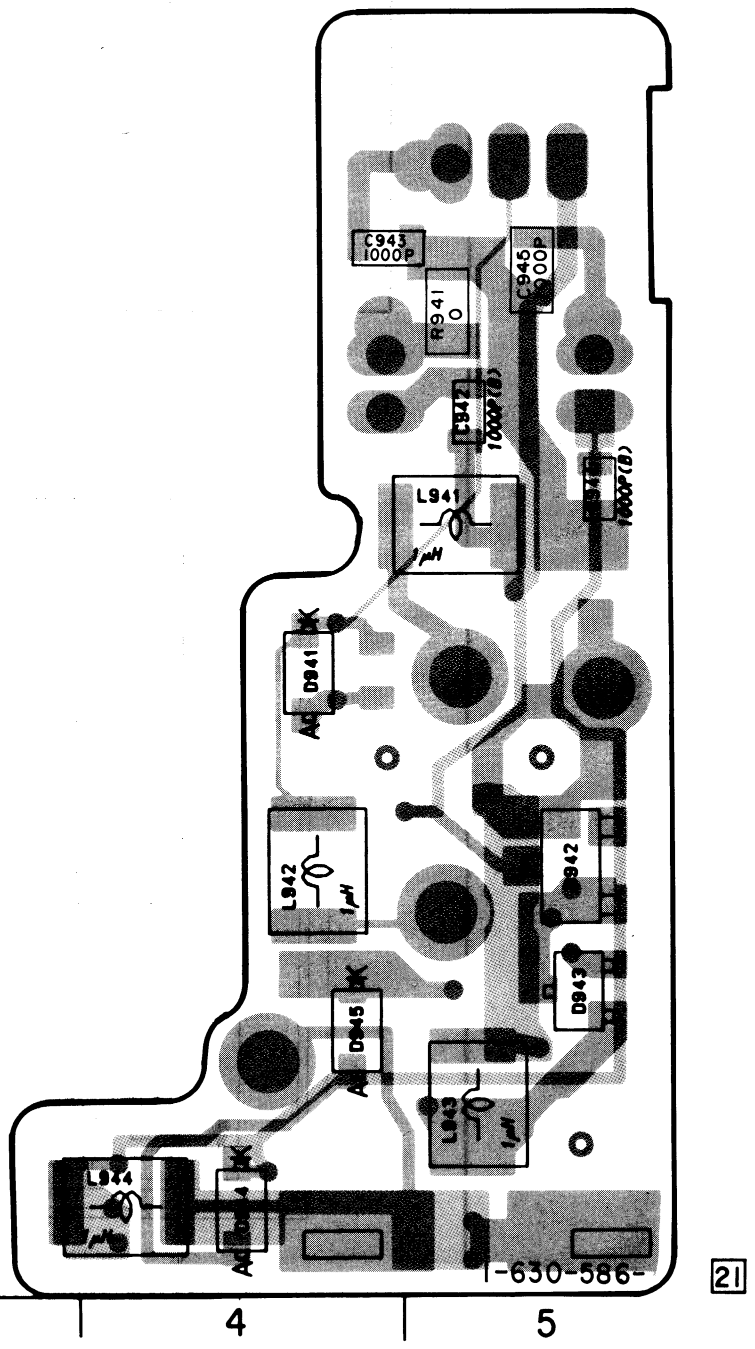
SIDE)


R474
680
R476
470
0.047(B)
C452
C458
R463
3300
C455
0.039(B)
C434
C436
C441
C445
C446
3300P(B)
C447
C471
100P
L401
D402
CN402
2P
1-575-
11
13
24
25
36
37
48
K
1-630-586-
11
10
11
12
13
14

EL-1 BOARD (COMPONENT SIDE)

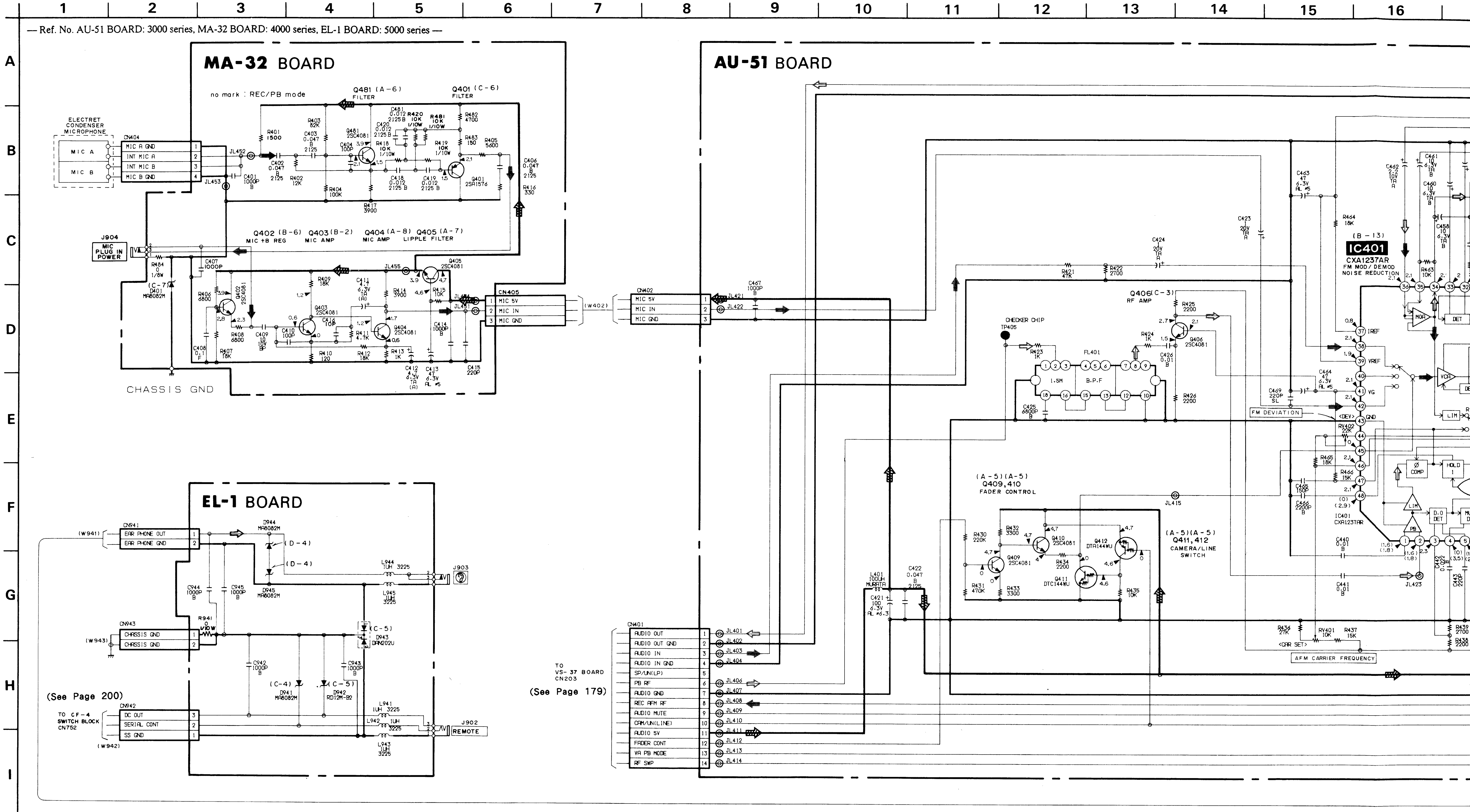

3
1
CN942
3P
1-566-758-11
CN943
1-565-541-11
2P
2
1
1-566-757
CN941
2P
J802
1P
1-565-276-11
J903
1P
1-568-027-11
L945
1μH
1-630-586-
21
A
B
C
D
1
2
3

EL-1 BOARD (CONDUCTOR SIDE)


C943
1000P
R941
0
C945
1000P
C942
1000P(B)
C941
1000P(B)
L941
1μH
D941
L942
1μH
D942
D943
D945
L943
1μH
L944
1μH
D944
K
A
1-630-586-
21
4
5

AU-51 (AUDIO), MA-32 (MIC AMP), EL-1 (REMOTE/EARPHONE JACK) SCHEMATIC DIAGRAMS

— Ref. No. AU-51 BOARD: 3000 series, MA-32 BOARD: 4000 series, EL-1 BOARD: 5000 series —



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12
13
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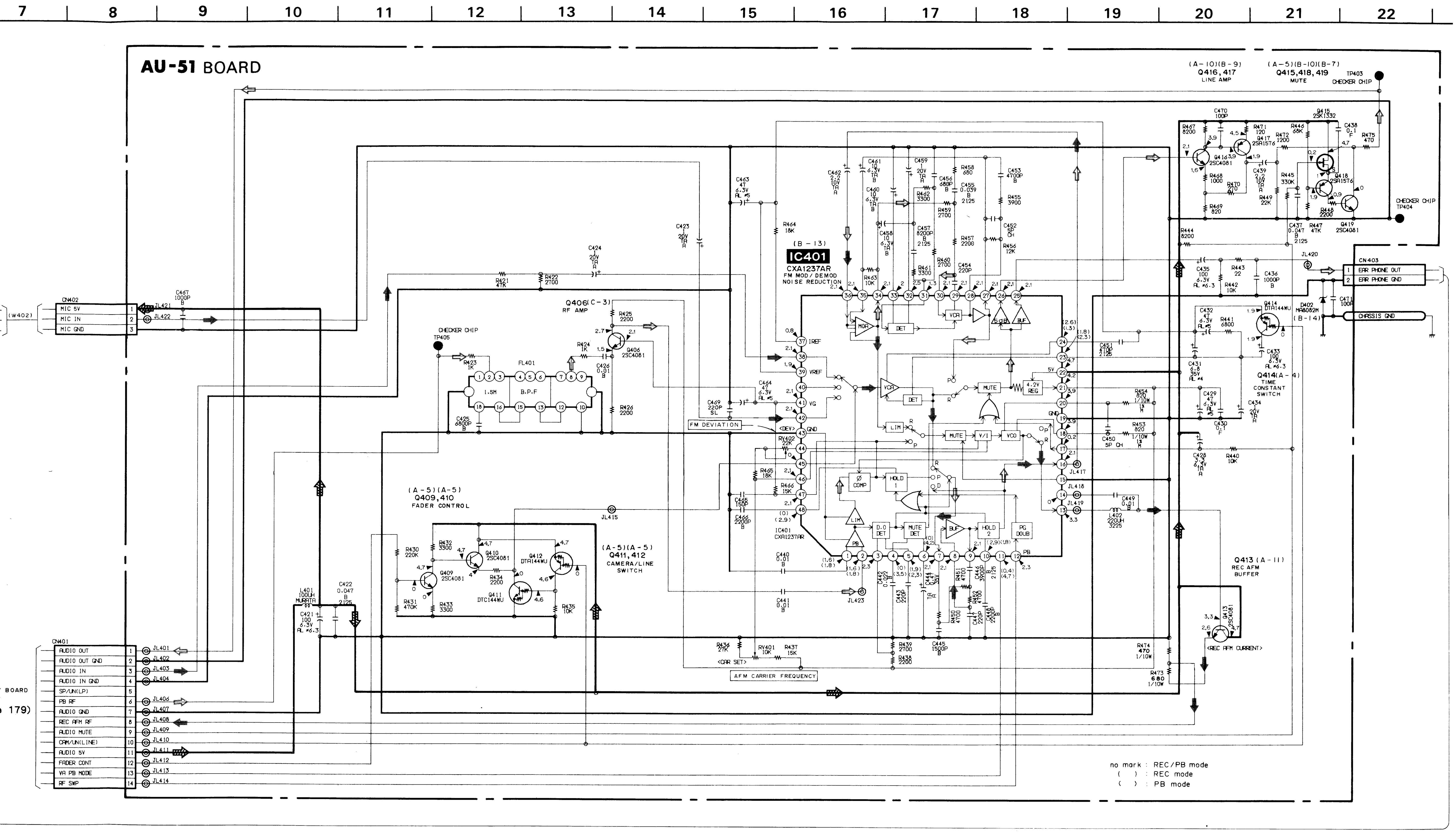
15
16
A
B
C
D
E
F
G
H
I
J
MA-32 BOARD
no mark : REC/PB mode
ELECTRET CONDENSER MICROPHONE
MIC A
MIC B
CN404
MIC A GND
INT MIC A
INT MIC B
MIC B GND
JL452
JL453
Q481 (A-6) FILTER
Q401 (C-6) FILTER
Q402 (B-6) MIC +B REG
Q403 (B-2) MIC AMP
Q404 (A-8) MIC AMP
Q405 (A-7) LIPPLE FILTER
J904
MIC PLUG IN POWER
D401 MA8082M
CN405
MIC 5V
MIC IN
MIC GND
CHASSIS GND
(W402)
EL-1 BOARD
CN941
EAR PHONE OUT
EAR PHONE GND
(W941)
D944 MA8082M
D945 MA8082M
L944 1UH 3225
L945 1UH 3225
J903
CN943
CHASSIS GND
(W943)
R941 0 1/10W
D943 DAN202U
D941 MA8082M
D942 RD12M-B2
(See Page 200)
TO CF-4 SWITCH BLOCK CN752
CN942
DC OUT
SERIAL CONT
SS GND
(W942)
L941 1UH 3225
L942 1UH 3225
L943 1UH 3225
J902
REMOTE
AU-51 BOARD
CN402
MIC 5V
MIC IN
MIC GND
JL421
JL422
CHECKER CHIP TP405
FL401 B.P.F
Q406 (C-3) RF AMP
(A-5)(A-5) Q409,410 FADER CONTROL
(A-5)(A-5) Q411,412 CAMERA/LINE SWITCH
JL415
L401 100UH MURATA
TO VS-37 BOARD CN203
(See Page 179)
CN401
AUDIO OUT
AUDIO OUT GND
AUDIO IN
AUDIO IN GND
SP/LN(LP)
PB RF
AUDIO GND
REC AFM RF
AUDIO MUTE
CAM/LN(LINE)
AUDIO 5V
FADER CONT
VA PB MODE
RF SWP
JL401
JL402
JL403
JL404
JL406
JL407
JL408
JL409
JL410
JL411
JL412
JL413
JL414
(B-13) IC401 CXA1237AR FM MOD/DEMOD NOISE REDUCTION
IREF
VREF
VG
GND
FM DEVIATION
RV402 22K
<CAR SET>
RV401 10K
AFM CARRIER FREQUENCY
JL423
MOA
DET
VCA
LIM
COMP
HOLD
D.O DET
PB

• **For schema**

• The code shov
position of loca


7
8
9
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11
12
13
14
15
16
17
18
19
20
21
22
AU-51 BOARD
(A-10)(B-9) Q416,417 LINE AMP
(A-5)(B-10)(B-7) Q415,418,419 MUTE
TP403 CHECKER CHIP
CHECKER CHIP TP404
CHECKER CHIP TP405
(B-13) IC401 CXA1237AR FM MOD/DEMOD NOISE REDUCTION
Q406(C-3) RF AMP
FL401
1.5M
B.P.F
(A-5)(A-5) Q409,410 FADER CONTROL
(A-5)(A-5) Q411,412 CAMERA/LINE SWITCH
Q414(A-4) TIME CONSTANT SWITCH
Q413 (A-11) REC AFM BUFFER
<REC AFM CURRENT>
FM DEVIATION
<CAR SET>
AFM CARRIER FREQUENCY
IC401 CXA1237AR
IREF
VREF
VG
GND
<DEV>
MOA
DET
VCA
BUF
5dB
MUTE
4.2V REG
LIM
V/I
VCO
Ø COMP
HOLD 1
HOLD 2
D.O DET
MUTE DET
PB
PG DOUB
CN402
MIC 5V
MIC IN
MIC GND
(W402)
CN403
EAR PHONE OUT
EAR PHONE GND
CHASSIS GND
D402 MA8082M (B-14)
CN401
AUDIO OUT
AUDIO OUT GND
AUDIO IN
AUDIO IN GND
SP/LN(LP)
PB RF
AUDIO GND
REC AFM RF
AUDIO MUTE
CAM/LN(LINE)
AUDIO 5V
FADER CONT
VA PB MODE
RF SWP
BOARD
179)
L401 100UH MURATA
L402 220UH
RV401 10K
RV402 22K

no mark : REC/PB mode
( ) : REC mode
〈 〉 : PB mode

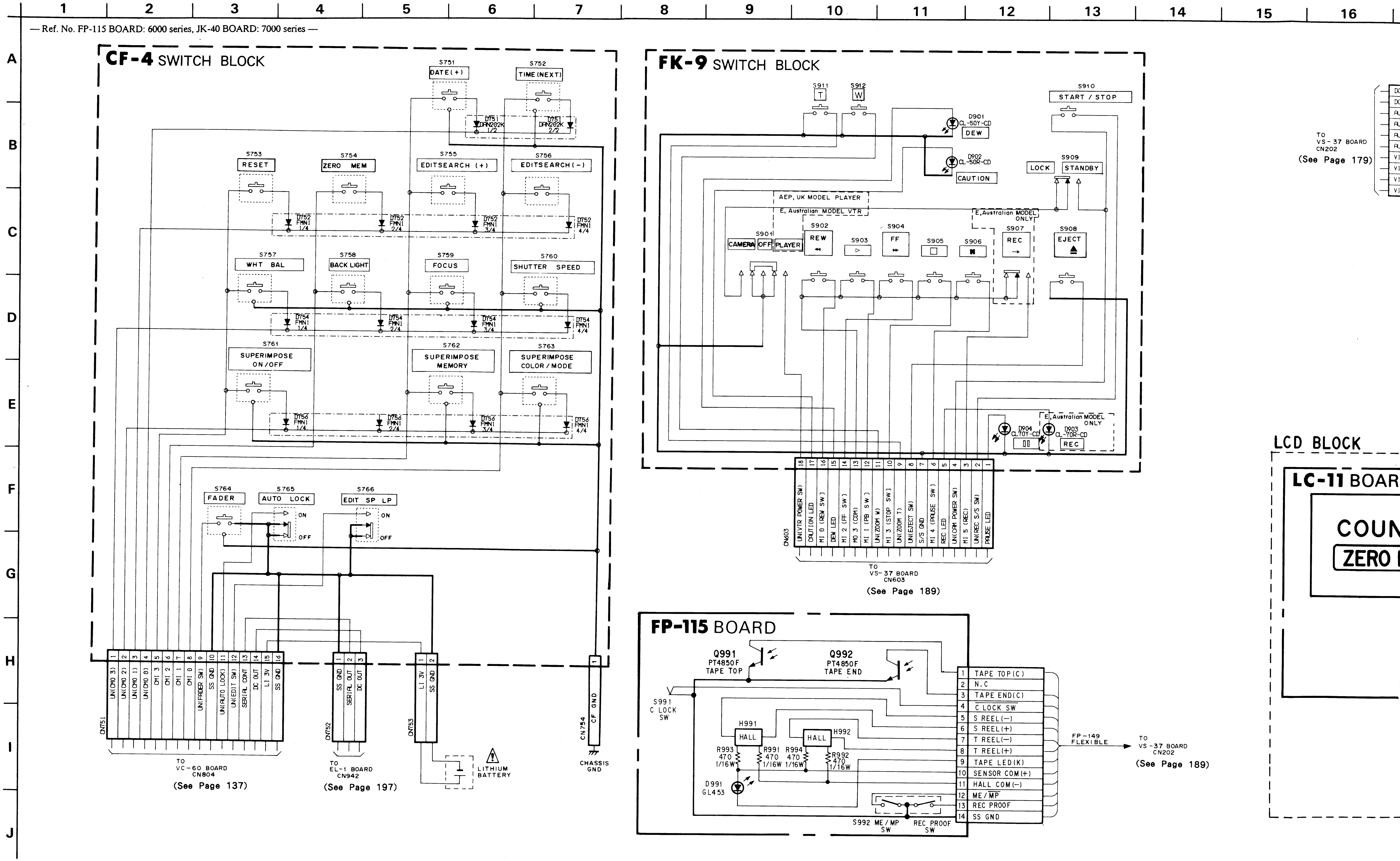
- **For schematic diagrams.**
- The code shown like (C-9) for each semiconductor indicates the position of location address on the printed wiring board.

- Signal path

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC				➡
PB				⇨

CF-4 (CAMERA FUNCTION SWITCH), FK-9 (VTR FUNCTION SWITCH), JK-40 (VIDEO/AUDIO INPUT/OUTPUT), LC-11 (LIQUID CRYSTAL DISPLAY), FP-115 (TAPE TOP/END SENSOR/TAPE SELECT) SCHEMATIC DIAGR

— Ref. No. FP-115 BOARD: 6000 series, JK-40 BOARD: 7000 series —


1
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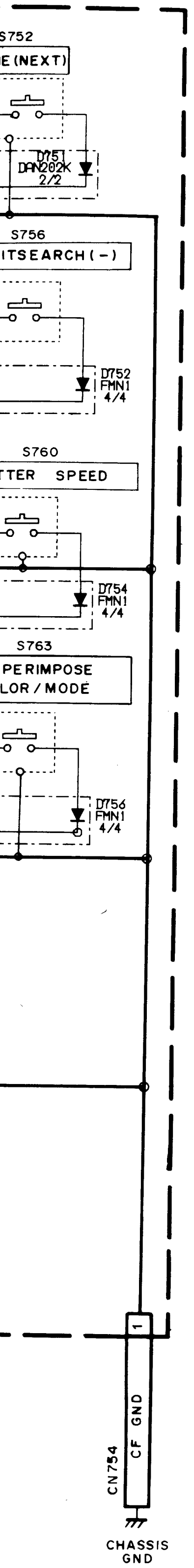
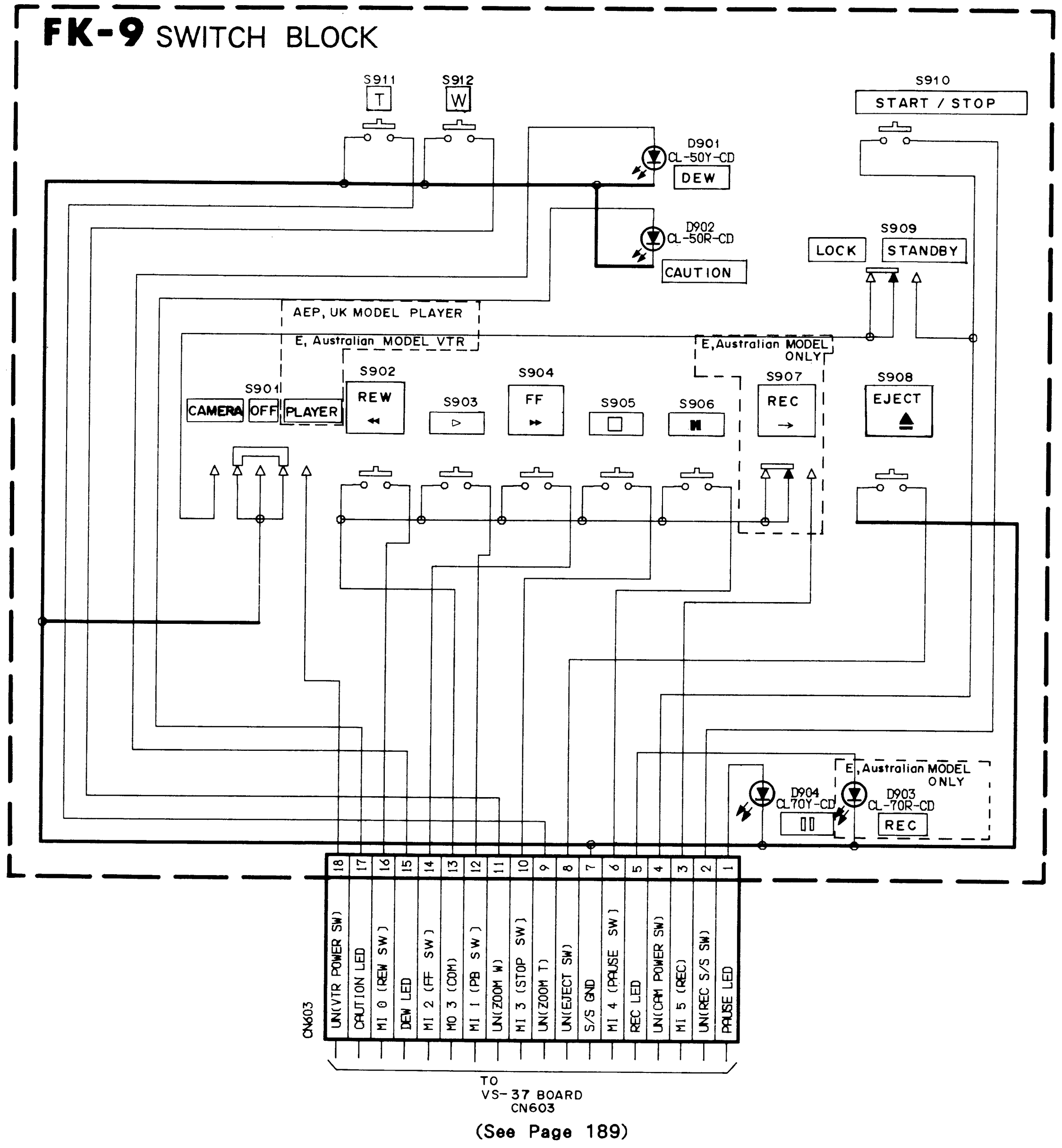
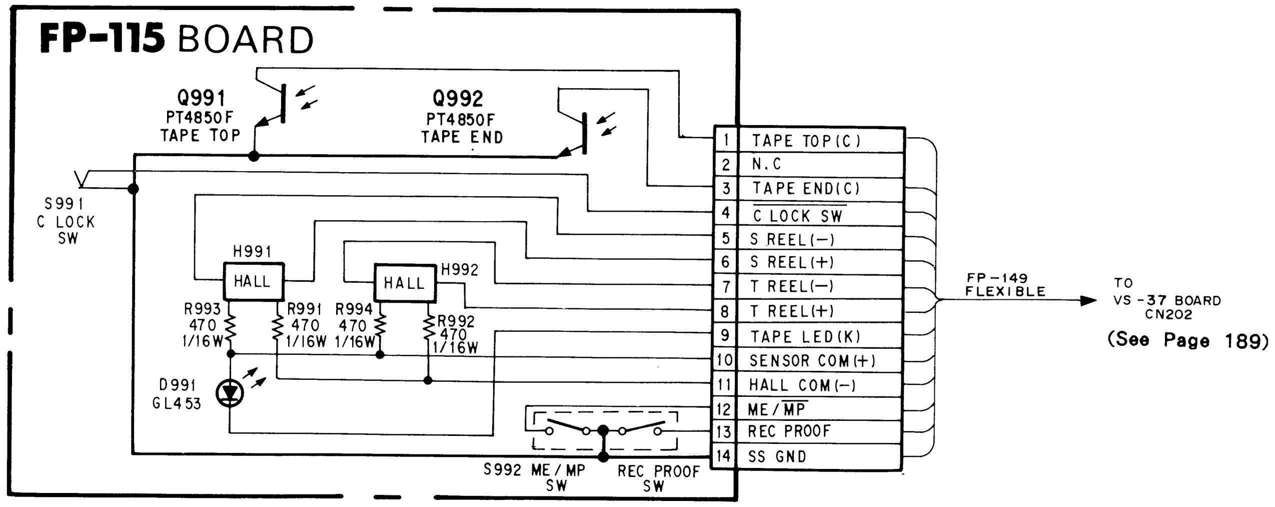
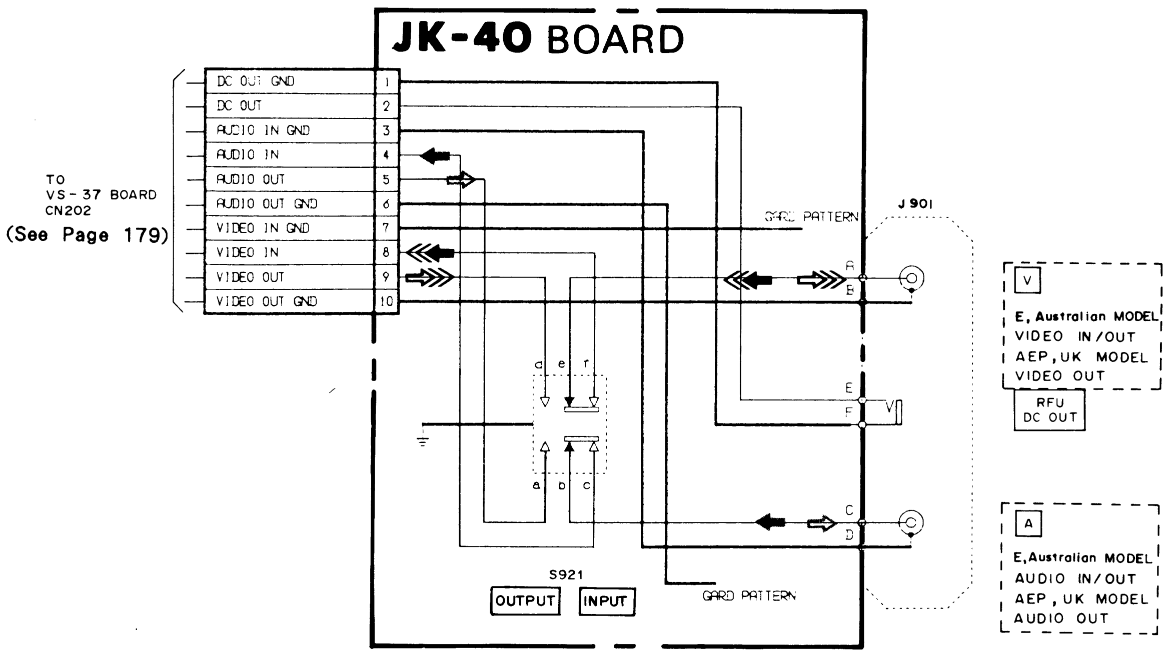
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
CF-4 SWITCH BLOCK
S751
DATE(+)
S752
TIME(NEXT)
D751 DAN202K 1/2
D751 DAN202K 2/2
S753
RESET
S754
ZERO MEM
S755
EDITSEARCH (+)
S756
EDITSEARCH(-)
D752 FMN1 1/4
D752 FMN1 2/4
D752 FMN1 3/4
D752 FMN1 4/4
S757
WHT BAL
S758
BACK LIGHT
S759
FOCUS
S760
SHUTTER SPEED
D754 FMN1 1/4
D754 FMN1 2/4
D754 FMN1 3/4
D754 FMN1 4/4
S761
SUPERIMPOSE ON/OFF
S762
SUPERIMPOSE MEMORY
S763
SUPERIMPOSE COLOR/MODE
D756 FMN1 1/4
D756 FMN1 2/4
D756 FMN1 3/4
D756 FMN1 4/4
S764
FADER
S765
AUTO LOCK
ON
OFF
S766
EDIT SP LP
ON
OFF
CN751
1 UN(CHO 3)
2 UN(CHO 2)
3 UN(CHO 1)
4 UN(CHO 0)
5 CHI 3
6 CHI 2
7 CHI 1
8 CHI 0
9 UN(FADER SW)
10 SS GND
11 UN(AUTO LOCK)
12 UN(EDIT SW)
13 SERIAL OUT
14 DC OUT
15 L1 3V
16 SS GND
TO VC-60 BOARD CN804
(See Page 137)
CN752
1 SS GND
2 SERIAL OUT
3 DC OUT
TO EL-1 BOARD CN942
(See Page 197)
CN753
1 L1 3V
2 SS GND
LITHIUM BATTERY
CN754
1 CF GND
CHASSIS GND
FK-9 SWITCH BLOCK
S911
T
S912
W
S910
START / STOP
D901 CL-50Y-CD
DEW
D902 CL-50R-CD
CAUTION
LOCK
S909
STANDBY
AEP, UK MODEL PLAYER
E, Australian MODEL VTR
E,Australian MODEL ONLY
S901
CAMERA
OFF
PLAYER
S902
REW
S903
S904
FF
S905
S906
S907
REC
S908
EJECT
E,Australian MODEL ONLY
D904 CL-70Y-CD
D903 CL-70R-CD
REC
CN603
18 UN(VTR POWER SW)
17 CAUTION LED
16 MI 0 (REW SW)
15 DEW LED
14 MI 2 (FF SW)
13 MO 3 (COM)
12 MI 1 (PB SW)
11 UN(ZOOM W)
10 MI 3 (STOP SW)
9 UN(ZOOM T)
8 UN(EJECT SW)
7 S/S GND
6 MI 4 (PAUSE SW)
5 REC LED
4 UN(CAM POWER SW)
3 MI 5 (REC)
2 UN(REC S/S SW)
1 PAUSE LED
TO VS-37 BOARD CN603
(See Page 189)
FP-115 BOARD
Q991 PT4850F TAPE TOP
Q992 PT4850F TAPE END
S991 C LOCK SW
H991
HALL
H992
HALL
R993 470 1/16W
R991 470 1/16W
R994 470 1/16W
R992 470 1/16W
D991 GL453
S992 ME/MP SW
REC PROOF SW
1 TAPE TOP(C)
2 N.C
3 TAPE END(C)
4 C LOCK SW
5 S REEL(-)
6 S REEL(+)
7 T REEL(-)
8 T REEL(+)
9 TAPE LED(K)
10 SENSOR COM(+)
11 HALL COM(-)
12 ME/MP
13 REC PROOF
14 SS GND
FP-149 FLEXIBLE
TO VS-37 BOARD CN202
(See Page 189)
TO VS-37 BOARD CN202
(See Page 179)
LCD BLOCK
LC-11 BOAR
COUN
ZERO


S752
E(NEXT)
D751 DAN202K 2/2
S756
ITSEARCH(−)
D752 FMN1 4/4
S760
TTER SPEED
D754 FMN1 4/4
S763
PERIMPOSE
LOR/MODE
D756 FMN1 4/4
CN754
CF GND
1
CHASSIS GND


FK-9 SWITCH BLOCK
S911 T
S912 W
D901 CL-50Y-CD DEW
D902 CL-50R-CD CAUTION
S910 START/STOP
LOCK
S909 STANDBY
AEP, UK MODEL PLAYER
E, Australian MODEL VTR
E, Australian MODEL ONLY
S901 CAMERA OFF PLAYER
S902 REW
S903
S904 FF
S905
S906
S907 REC
S908 EJECT
E, Australian MODEL ONLY
D904 CL-70Y-CD
D903 CL-70R-CD REC
CN603
18 UN(VTR POWER SW)
17 CAUTION LED
16 MI 0 (REW SW)
15 DEW LED
14 MI 2 (FF SW)
13 MO 3 (COM)
12 MI 1 (PB SW)
11 UN(ZOOM W)
10 MI 3 (STOP SW)
9 UN(ZOOM T)
8 UN(EJECT SW)
7 S/S GND
6 MI 4 (PAUSE SW)
5 REC LED
4 UN(CAM POWER SW)
3 MI 5 (REC)
2 UN(REC S/S SW)
1 PAUSE LED
TO VS-37 BOARD CN603
(See Page 189)


FP-115 BOARD
Q991 PT4850F TAPE TOP
Q992 PT4850F TAPE END
S991 C LOCK SW
H991 HALL
H992 HALL
R993 470 1/16W
R991 470 1/16W
R994 470 1/16W
R992 470 1/16W
D991 GL453
S992 ME/MP SW
REC PROOF SW
1 TAPE TOP(C)
2 N.C
3 TAPE END(C)
4 C LOCK SW
5 S REEL(−)
6 S REEL(+)
7 T REEL(−)
8 T REEL(+)
9 TAPE LED(K)
10 SENSOR COM(+)
11 HALL COM(−)
12 ME/MP
13 REC PROOF
14 SS GND
FP-149 FLEXIBLE
TO VS-37 BOARD CN202
(See Page 189)

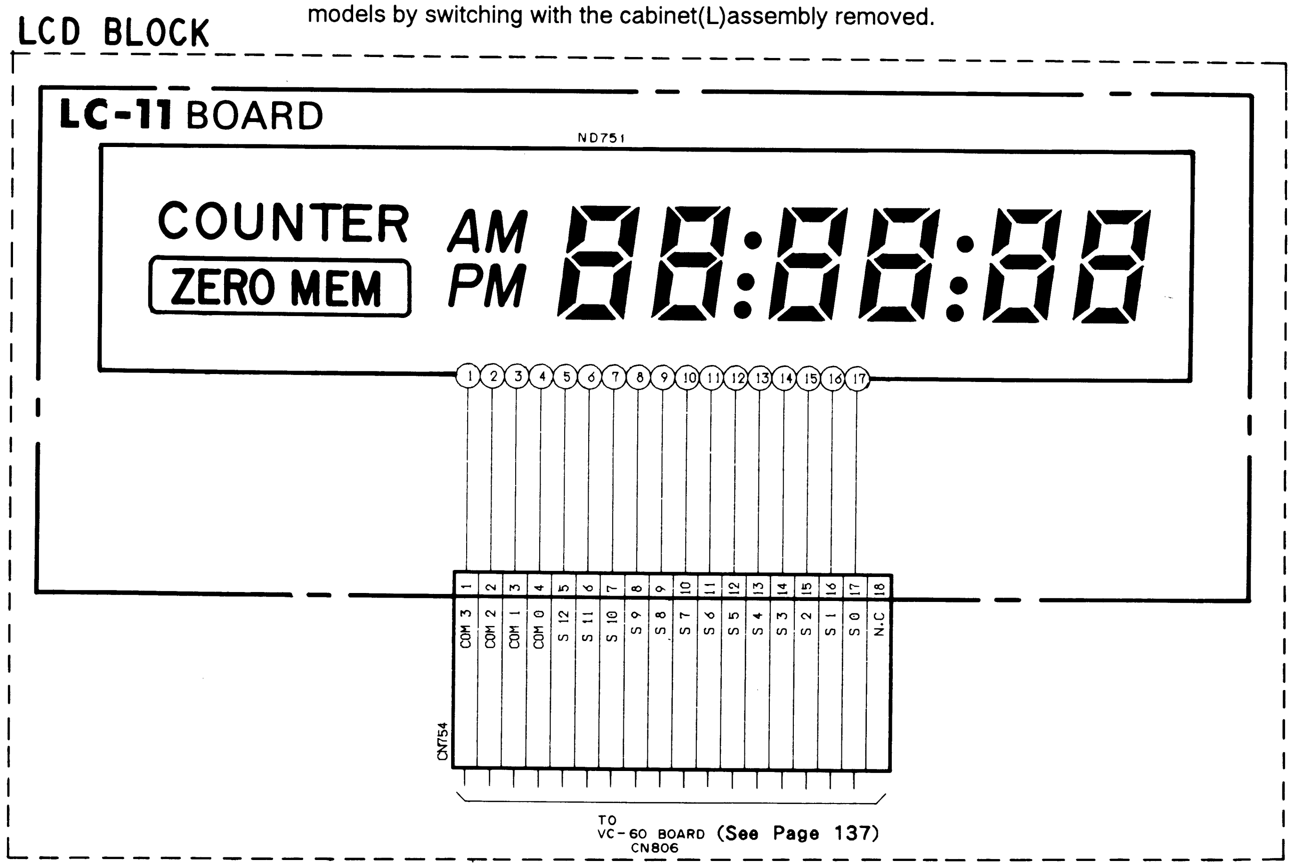

JK-40 BOARD
TO VS-37 BOARD CN202
(See Page 179)
1 DC OUT GND
2 DC OUT
3 AUDIO IN GND
4 AUDIO IN
5 AUDIO OUT
6 AUDIO OUT GND
7 VIDEO IN GND
8 VIDEO IN
9 VIDEO OUT
10 VIDEO OUT GND
GND PATTERN
J901
V
E, Australian MODEL VIDEO IN/OUT
AEP, UK MODEL VIDEO OUT
RFU DC OUT
A
E, Australian MODEL AUDIO IN/OUT
AEP, UK MODEL AUDIO OUT
S921
OUTPUT INPUT

[Video/audio input/output switch (S921 on the JK-40 board) – for AEP/UK model]

Switch S921 is mounted on the JK-40 board, regardless of the destinations.

For AEP/UK model, however, the output cover is provided that won't be attached at the input position.

For AEP/UK model, S921 will function as IN/OUT switch of the video/audio like AUS and E models by switching with the cabinet(L)assembly removed.


LCD BLOCK
LC-11 BOARD
ND751
COUNTER
ZERO MEM
AM
PM
88:88:88
CN754
1 COM 3
2 COM 2
3 COM 1
4 COM 0
5 S 12
6 S 11
7 S 10
8 S 9
9 S 8
10 S 7
11 S 6
12 S 5
13 S 4
14 S 3
15 S 2
16 S 1
17 S 0
18 N.C
TO VC-60 BOARD CN806 (See Page 137)

- Signal path

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC			➡⟫	➡
PB			⇨⟫	⇨

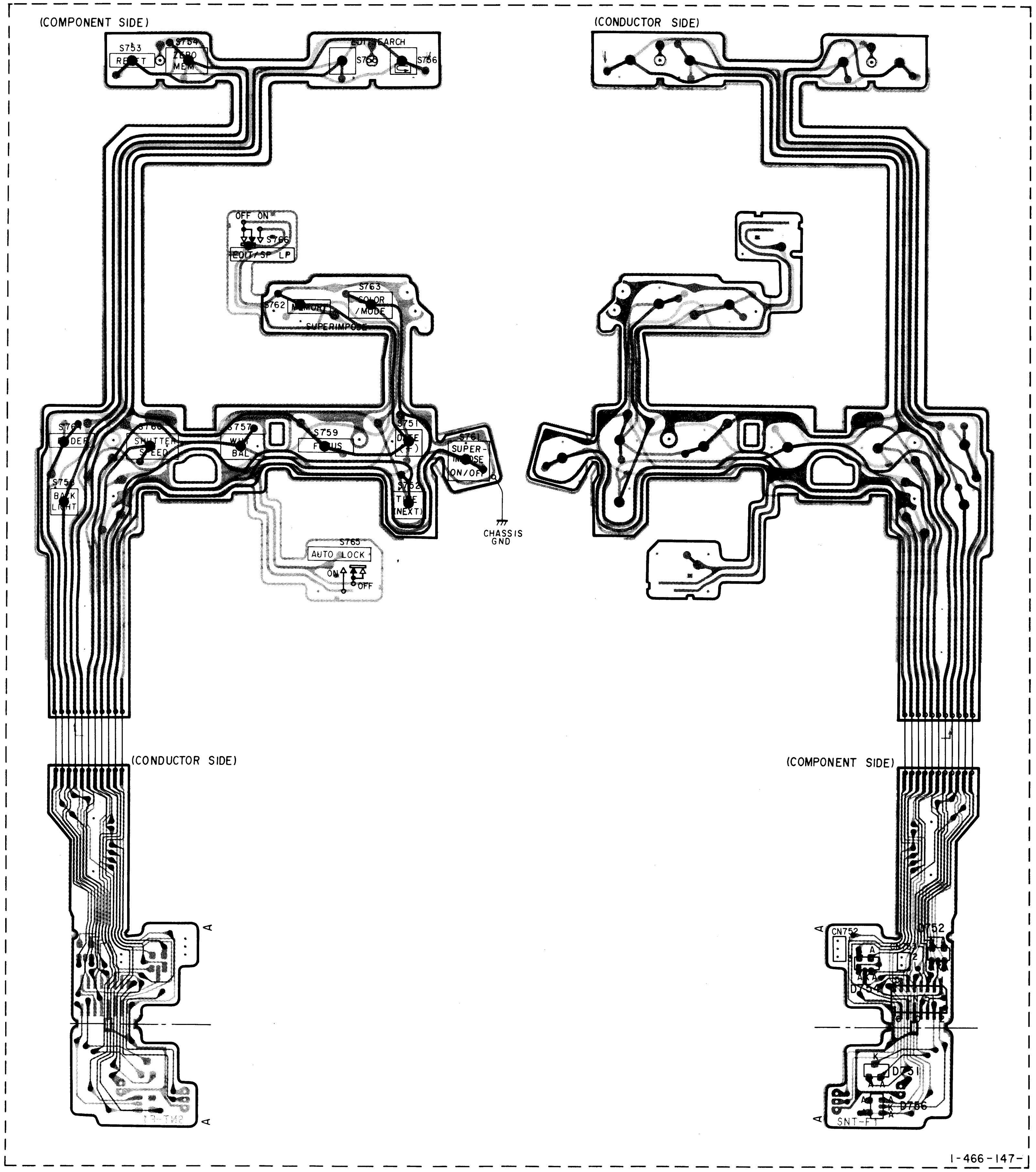
CF-4 (CAMERA FUNCTION SWITCH), FK-9 (VTR FUNCTION SWITCH), JK-40 (VIDEO/AUDIO INPUT/OUTPUT), LC-11 (LIQUID CRYSTAL DISPLAY), FP-115 (TAPE TOP/END SENSOR/TAPE SELECT) PRINTED WIRING B

— Ref. No. FP-115 BOARD: 6000 series, JK-40 BOARD: 7000 series —

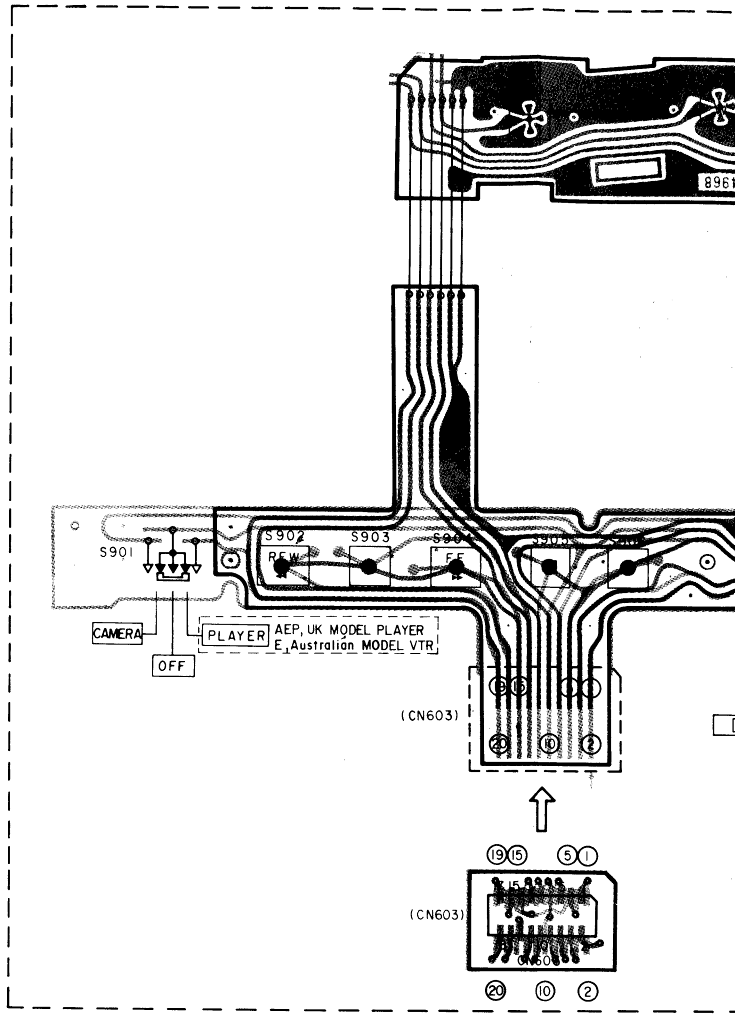
- **For printed wiring boards.**
- ⊗ : Through hole

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the pattern face are indicated.

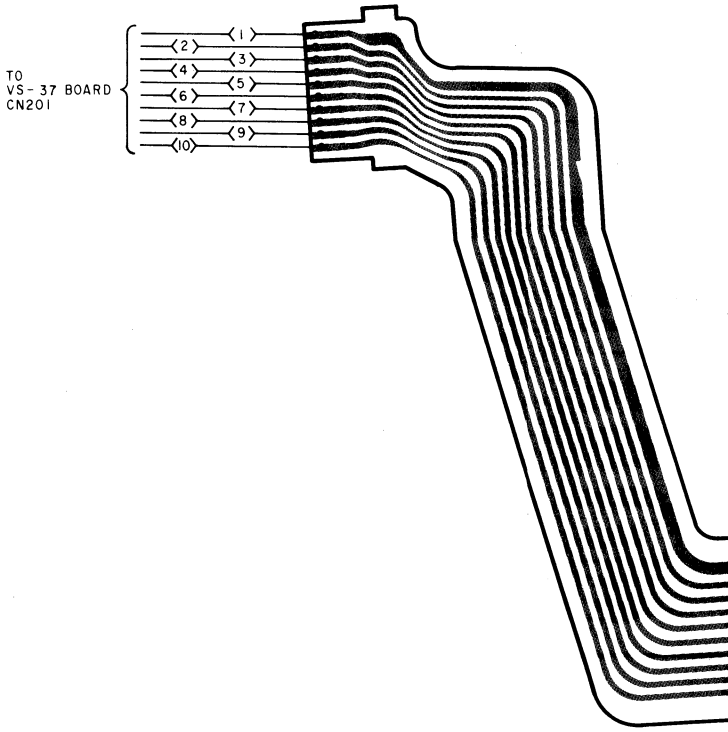
CF-4 SWITCH BLOCK

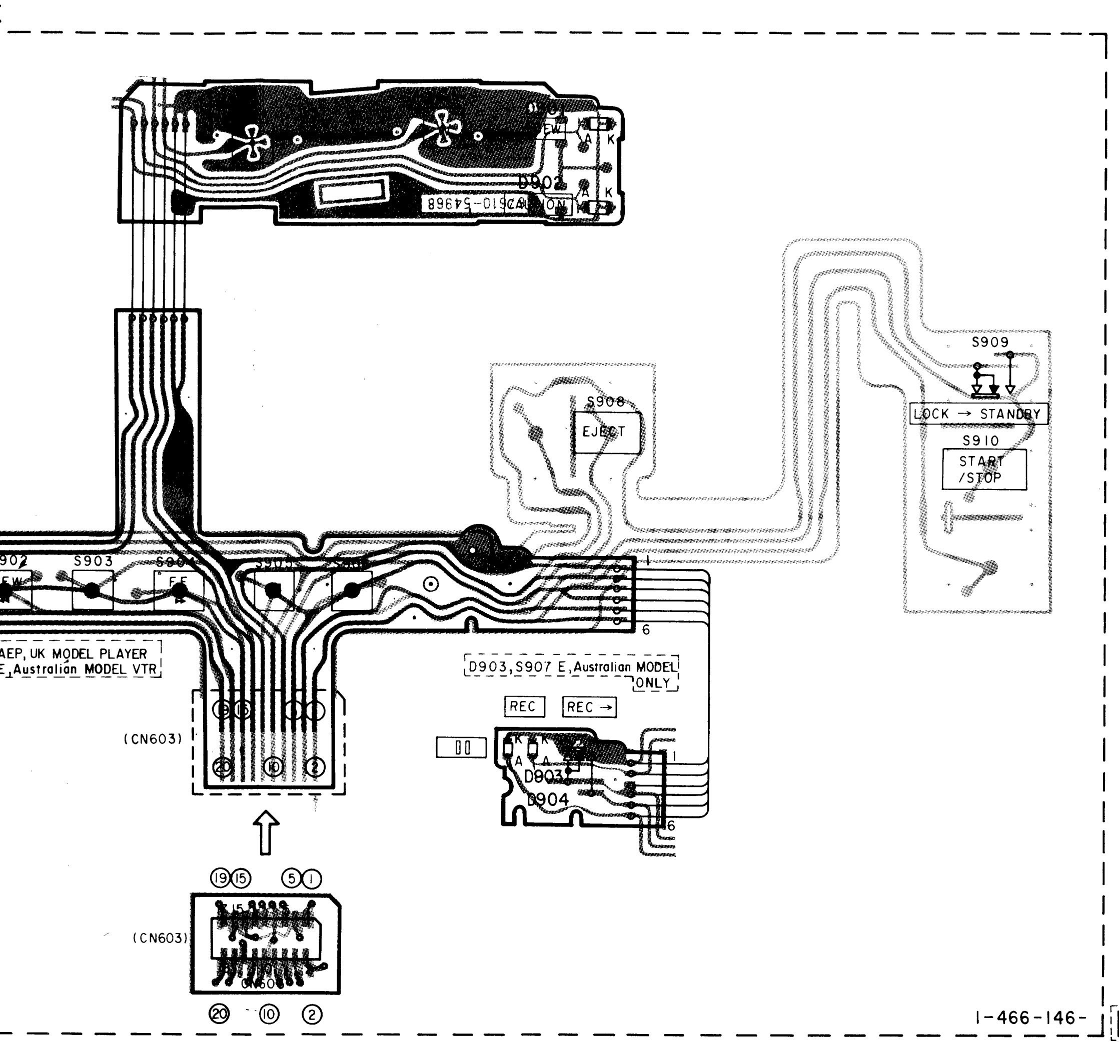

(COMPONENT SIDE)
(CONDUCTOR SIDE)
S753
RESET
S754
ZERO
MEM
AUTO SEARCH
S755
S756
OFF ON
S766
EDIT/SP LP
S763
COLOR
/MODE
S762
MEMORY
SUPERIMPOSE
S760
FADER
S758
SHUTTER
SPEED
S757
WHT
BAL
S759
FOCUS
S751
DATE
(OFF)
S761
SUPER-
IMPOSE
ON/OFF
S752
TIME
(NEXT)
BACK
LIGHT
CHASSIS
GND
S765
AUTO LOCK
ON
OFF
(CONDUCTOR SIDE)
(COMPONENT SIDE)
A
CN752
D752
K
D751
D756
SNT-F1
1-466-147-
12

FK-9 SWITCH BLOCK


8961
S901
CAMERA
OFF
PLAYER
AEP, UK MODEL PLAYER
E, Australian MODEL VTR
S902
REW
S903
S904
FF
S905
(CN603)
⑳ ⑩ ②
⑲⑮ ⑤①
(CN603)
⑳ ⑩ ②

JK-40 BOARD (CONDUCTOR SIDE)

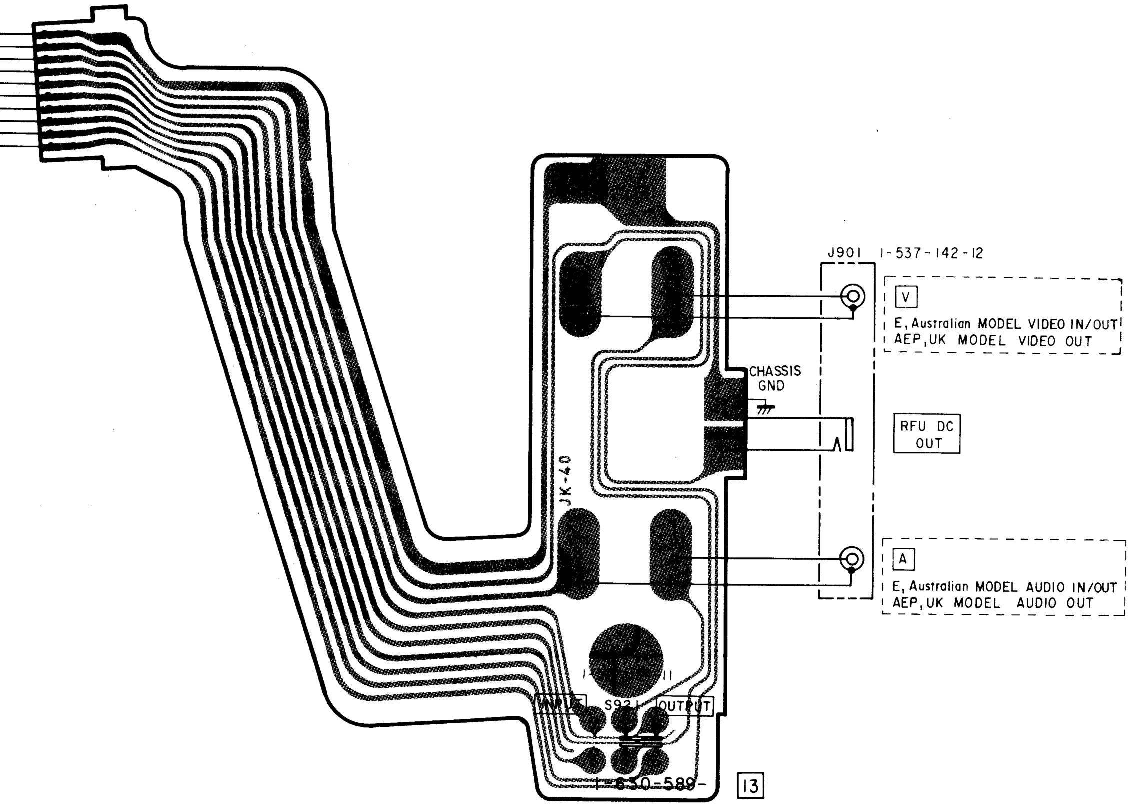

TO
VS-37 BOARD
CN201
1
2
3
4
5
6
7
8
9
10


S902
S903
S904
S905
S906
REW
FF
AEP, UK MODEL PLAYER
E, Australian MODEL VTR
(CN603)
⑲ ⑮ ⑤ ①
⑳ ⑩ ②
D902
D910-54968
S908
EJECT
S909
LOCK → STANDBY
S910
START /STOP
D903, S907 E, Australian MODEL ONLY
REC
REC →
D903
D904
A K
1
6
1-466-146-

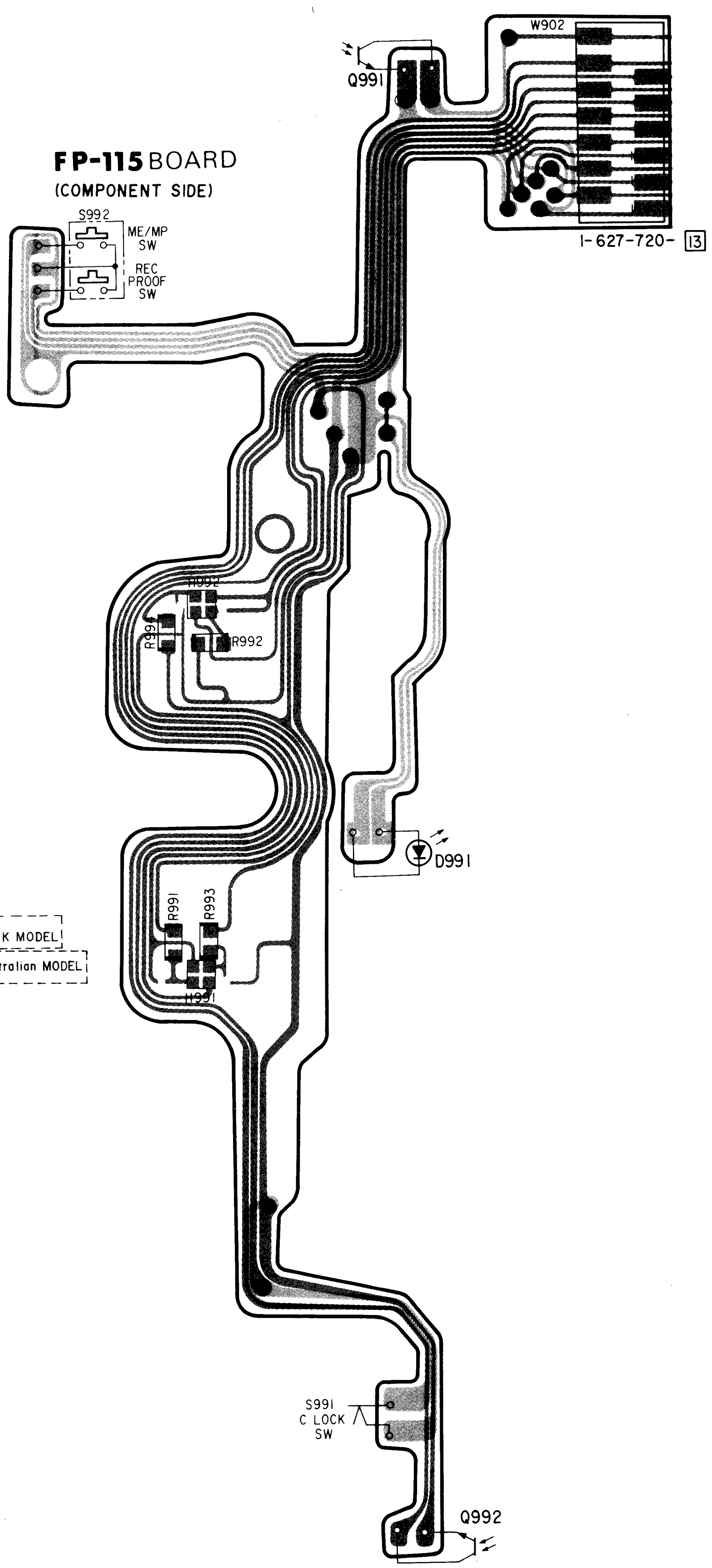
21 AEP, UK MODEL

11 E, Australian MODEL

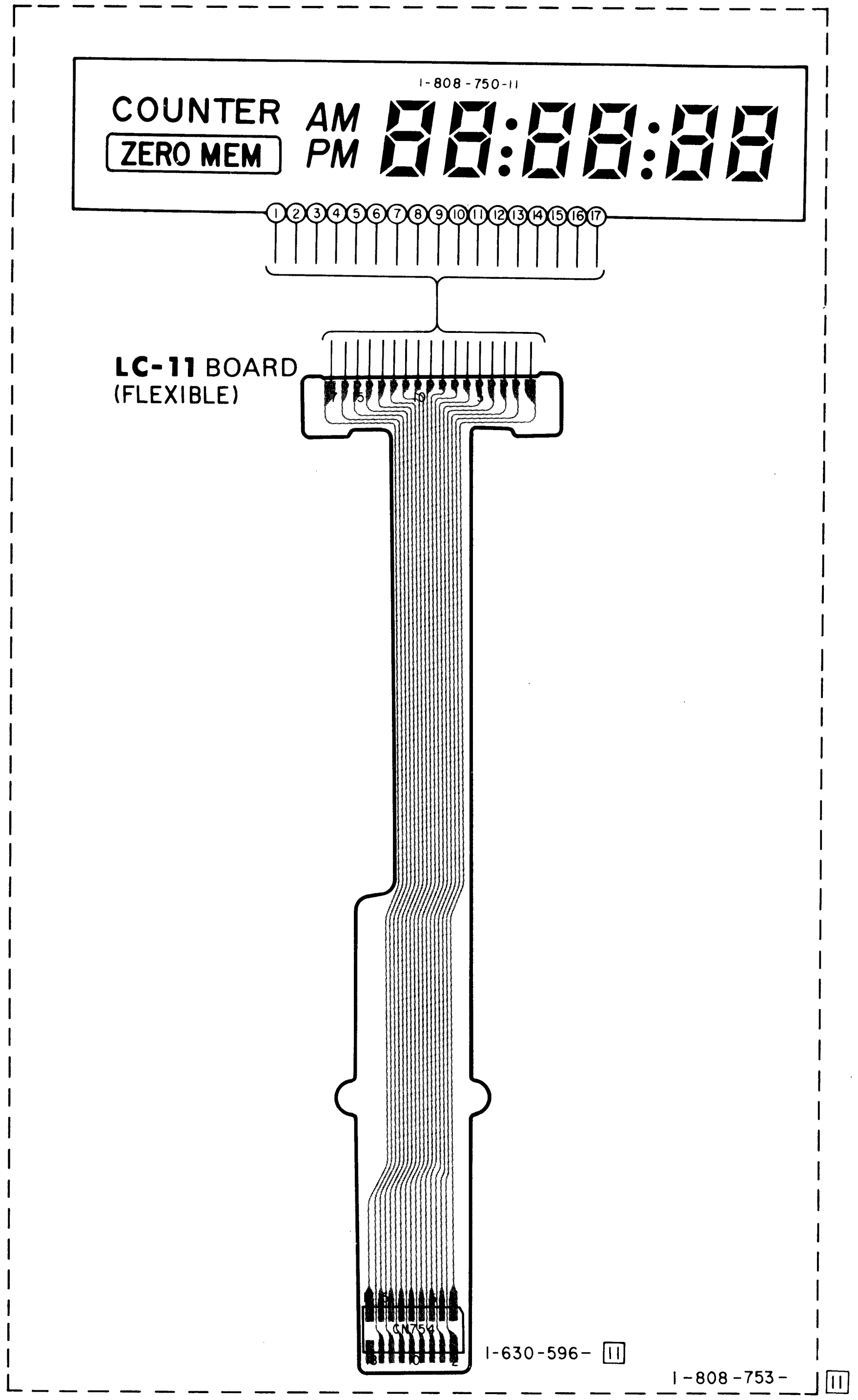
BOARD (CONDUCTOR SIDE)


J901 1-537-142-12
V
E, Australian MODEL VIDEO IN/OUT
AEP, UK MODEL VIDEO OUT
CHASSIS GND
RFU DC OUT
A
E, Australian MODEL AUDIO IN/OUT
AEP, UK MODEL AUDIO OUT
JK-40
S921
INPUT
OUTPUT
1-630-589- 13

FP-115 BOARD
(COMPONENT SIDE)


W902
Q991
1-627-720- 13
S992
ME/MP SW
REC PROOF SW
R992
R994
R991
R993
D991
S991
C LOCK SW
Q992

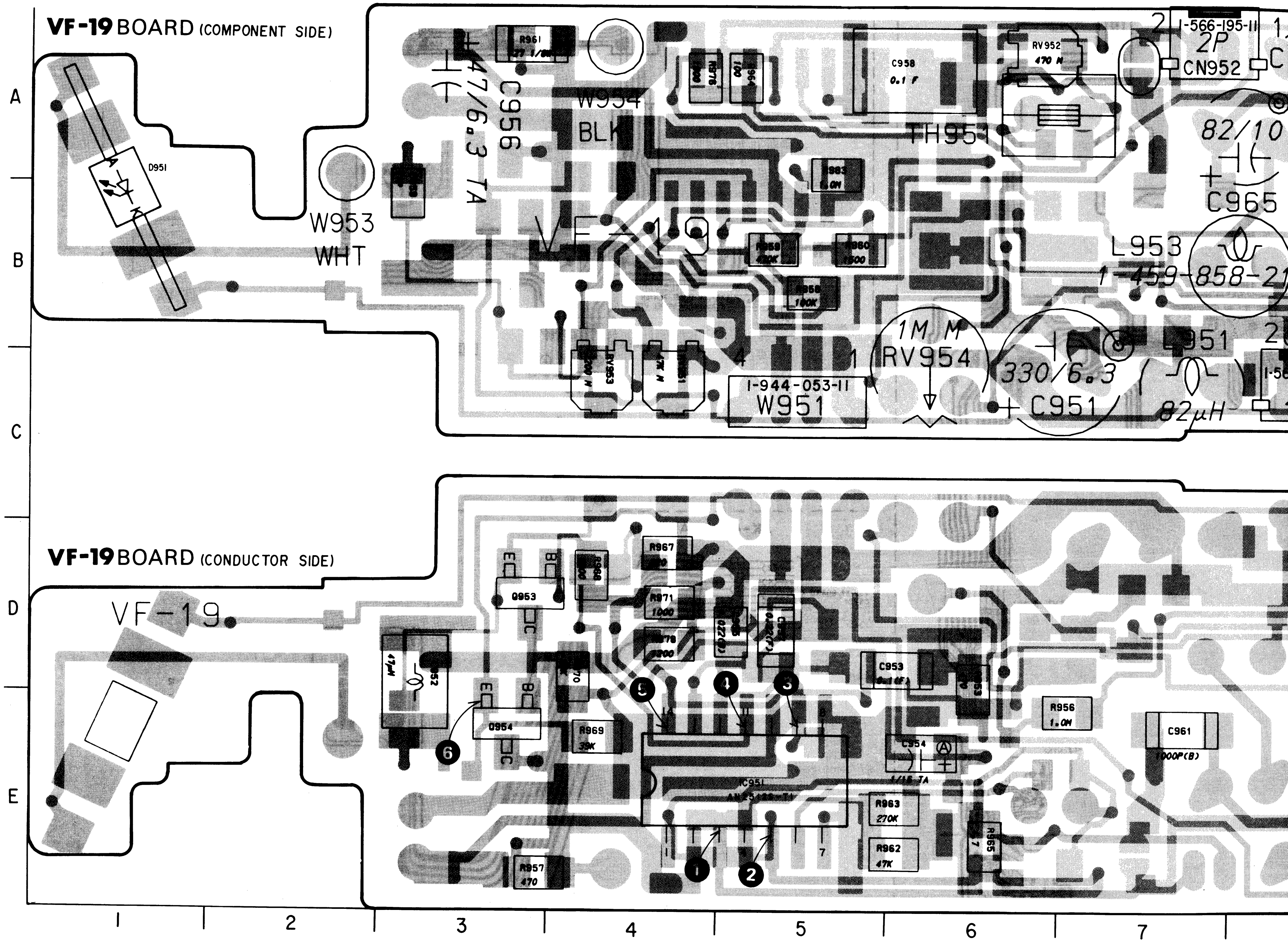
LCD BLOCK


1-808-750-11
COUNTER
ZERO MEM
AM
PM
88:88:88
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯ ⑰
LC-11 BOARD
(FLEXIBLE)
CN750
1-630-596- 11
1-808-753- 11

VF-19 (ELECTRICAL VIEW FINDER), TL-26 (TALLY LED) PRINTED WIRING BOARDS

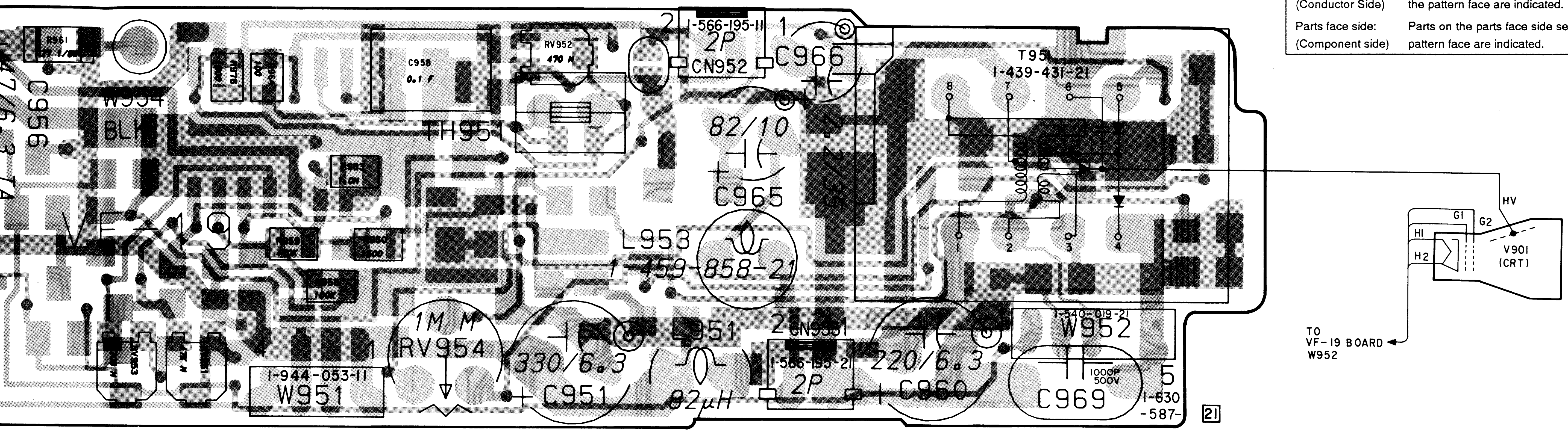
— Ref. No. VF-19 BOARD: 8000 series, TL-26 BOARD: 9000 series —

- **For printed wiring boards.**
- Through hole (⊗) is omitted.

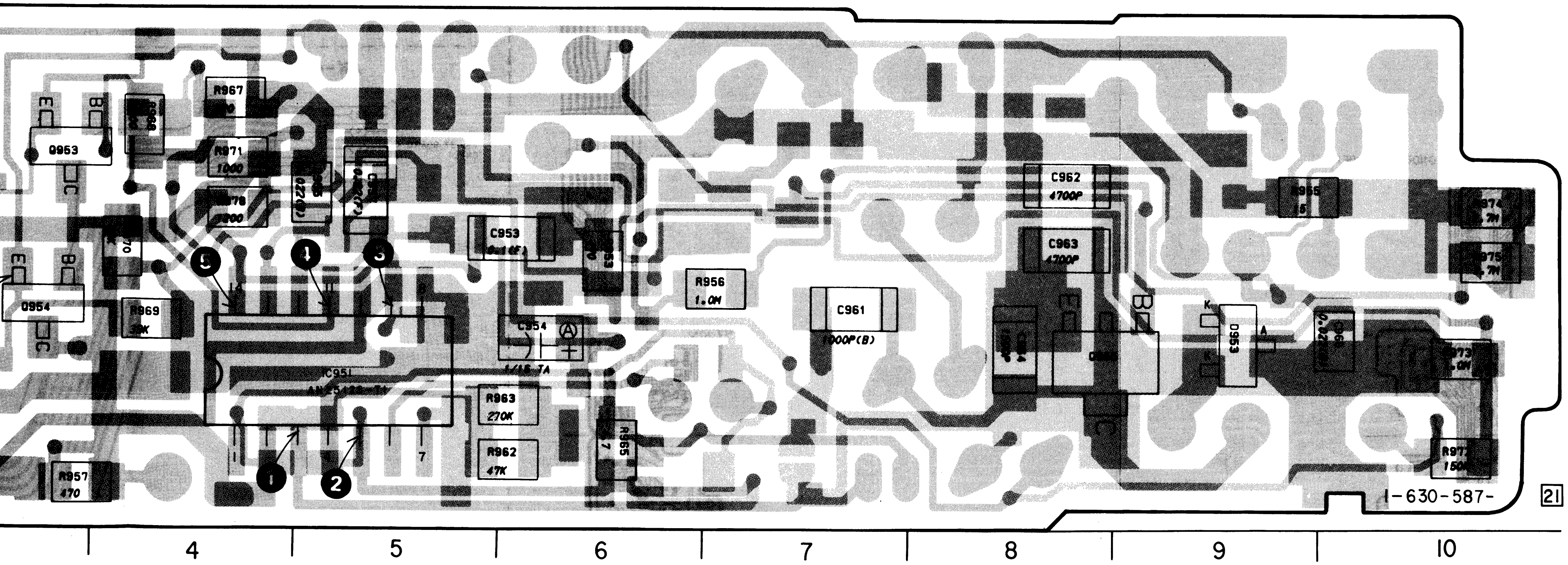

VF-19 BOARD (COMPONENT SIDE)
VF-19 BOARD (CONDUCTOR SIDE)
A
B
C
D
E
1
2
3
4
5
6
7
D951
W953
WHT
C956
47/6.3 TA
R961
W954
BLK
VF-19
C958
0.1 F
RV952
470 K
TH951
1-566-195-11
2P
CN952
82/10
C965
L953
1-459-858-21
R959
R960
R958
100K
RV953
1M M
RV954
1-944-053-11
W951
330/6.3
C951
L951
82μH
R967
R968
Q953
R971
R970
C953
R956
1.0M
C961
1000P(B)
Q954
R969
33K
IC951
C954
R963
270K
R962
47K
R965
R957
470
47μH
L952
E
B
C
1
2
3
4
5
6
7

Caution:

Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the pattern face are indicated.

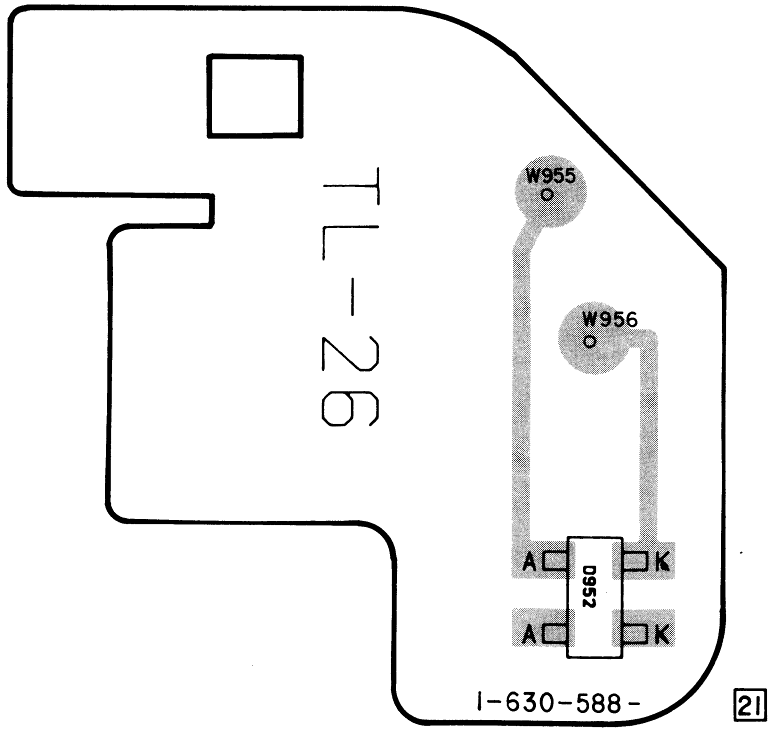


R961
C956
W954
BLK
VF-19
C958
0.1 F
RV952
470 M
TH951
2
1-566-195-11
2P
CN952
1
C966
82/10
C965
2.2/35
T951
1-439-431-21
8
7
6
5
1
2
3
4
L953
1-459-858-21
1M M
RV954
330/6.3
C951
L951
82μH
2
CN953
1
1-566-195-21
2P
220/6.3
C960
1-540-019-21
W952
1000P
500V
C969
5
1-630
-587-
21
1-944-053-11
W951
RV953
HV
G1
G2
H1
H2
V901
(CRT)
TO
VF-19 BOARD
W952



Q953
R967
R971
1000
C953
Q954
R969
C954
IC951
R956
1.0M
C961
1000P(B)
C962
4700P
C963
4700P
D953
R963
270K
R962
47K
R957
470
R965
R972
1
2
7
1-630-587-
21
4
5
6
7
8
9
10

TL-26 BOARD (CONDUCTOR SIDE)

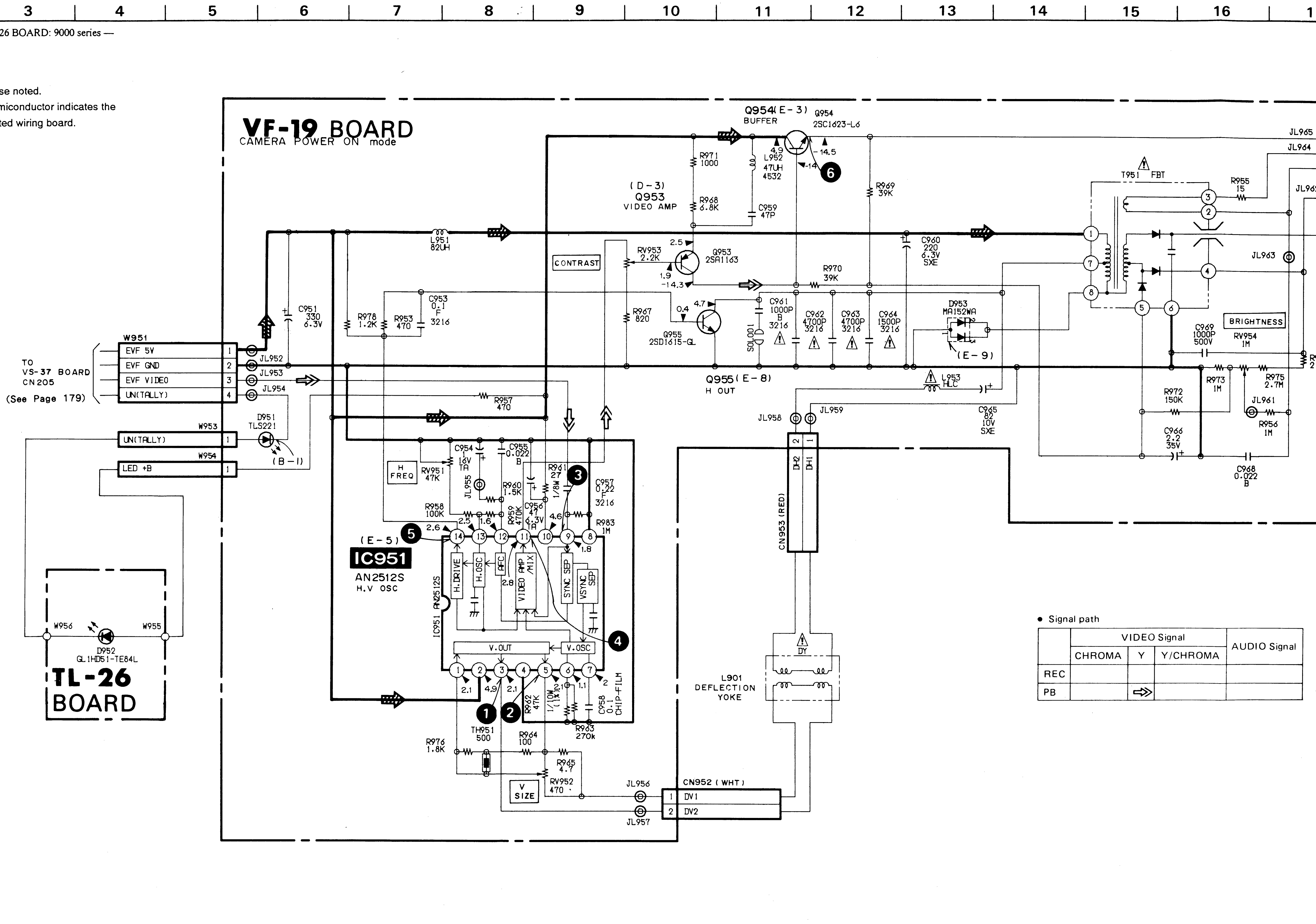


TL-26
W955
W956
D952
A
K
A
K
1-630-588-
21

VF-19 (ELECTRICAL VIEW FINDER), TL-26 (TALLY LED) SCHEMATIC DIAGRAMS

— Ref. No. VF-19 BOARD: 8000 series, TL-26 BOARD: 9000 series —

- **For schematic diagrams.**
- Chip resistor are 1/10W unless otherwise noted.
- The code shown like (C-9) for each semiconductor indicates the position of location address on the printed wiring board.


1
2
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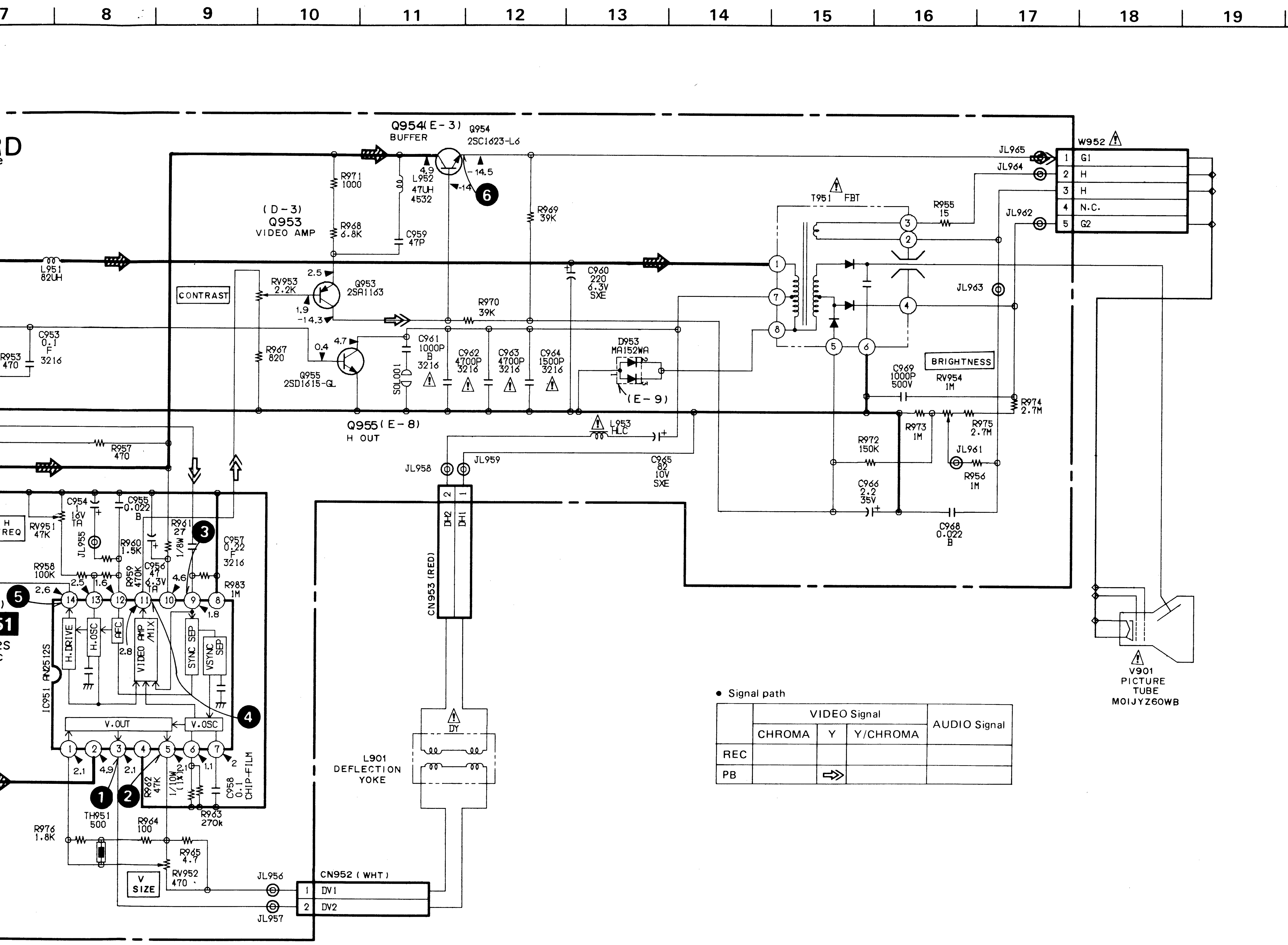
8
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
VF-19 BOARD
CAMERA POWER ON mode
Q954 (E-3) BUFFER
Q954 2SC1623-L6
4.9
-14.5
-14
6
R971 1000
L952 47UH 4532
(D-3) Q953 VIDEO AMP
R968 6.8K
C959 47P
R969 39K
T951 FBT
R955 15
JL965
JL964
L951 82UH
CONTRAST
RV953 2.2K
2.5
Q953 2SA1163
1.9
-14.3
R970 39K
C960 220 6.3V SXE
JL963
C951 330 6.3V
R978 1.2K
R953 470
C953 0.1 F 3216
0.4
4.7
C961 1000P B 3216
C962 4700P 3216
C963 4700P 3216
C964 1500P 3216
D953 MA152WA
(E-9)
BRIGHTNESS
RV954 1M
C969 1000P 500V
R967 820
Q955 2SD1615-GL
SOL001
W951
EVF 5V
EVF GND
EVF VIDEO
UN(TALLY)
TO VS-37 BOARD CN205
(See Page 179)
JL952
JL953
JL954
Q955 (E-8) H OUT
L953 HLC
R972 150K
R973 1M
R975 2.7M
JL961
R956 1M
R957 470
D951 TLS221
(B-1)
JL958
JL959
C965 82 10V SXE
C966 2.2 35V
C968 0.022 B
W953
UN(TALLY)
W954
LED +B
H FREQ
RV951 47K
C954 1 16V TA
C955 0.022 B
JL955
R960 1.5K
R961 27 1/8W
3
C957 0.22 F 3216
R958 100K
R959 470K
C956 47 6.3V TA
R983 1M
2.6
2.5
1.6
4.6
1.8
5
(E-5)
IC951
AN2512S
H.V OSC
IC951 AN2512S
H.DRIVE
H.OSC
AFC
AMP/MIX
VIDEO
2.8
SYNC SEP
VSYNC SEP
4
V.OUT
V.OSC
2.1
4.9
2.1
2.1
1.1
2
R962 47K
1/10W (1K)
C958 0.1 CHIP-FILM
1
2
TH951 500
R964 100
R963 270k
R976 1.8K
R965 4.7
RV952 470
V SIZE
JL956
JL957
CN952 (WHT)
DV1
DV2
CN953 (RED)
DH2
DH1
DY
L901 DEFLECTION YOKE
W956
W955
D952 GL1HD51-TE84L
TL-26 BOARD

- Signal path

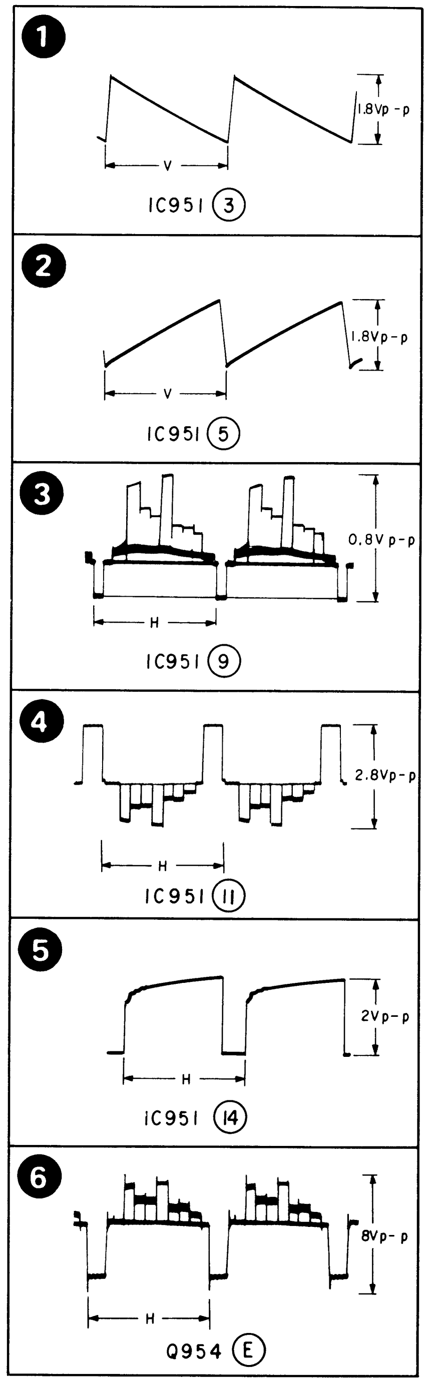
	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC				
PB		⇨		


7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
Q954(E-3)
BUFFER
Q954
2SC1623-L6
4.9
-14.5
-14
L952
47UH
4532
R971
1000
R968
6.8K
C959
47P
(D-3)
Q953
VIDEO AMP
2.5
Q953
2SA1163
1.9
-14.3
RV953
2.2K
CONTRAST
R969
39K
R970
39K
C960
220
6.3V
SXE
L951
82UH
C953
0.1
F
3216
R953
470
R967
820
4.7
0.4
Q955
2SD1615-GL
C961
1000P
B
3216
SOL001
C962
4700P
3216
C963
4700P
3216
C964
1500P
3216
D953
MA152WA
(E-9)
Q955(E-8)
H OUT
L953
HLC
C965
82
10V
SXE
R957
470
JL958
JL959
T951 FBT
R955
15
JL965
JL964
JL962
JL963
W952
1 G1
2 H
3 H
4 N.C.
5 G2
BRIGHTNESS
C969
1000P
500V
RV954
1M
R974
2.7M
R973
1M
R975
2.7M
R972
150K
JL961
R956
1M
C966
2.2
35V
C968
0.022
B
CN953 (RED)
2 DH2
1 DH1
H FREQ
RV951
47K
C954
1
16V
TA
C955
0.022
B
JL955
R960
1.5K
R961
27
1/8W
C957
0.22
F
3216
R958
100K
R959
470K
C956
47
6.3V
TA
R983
1M
2.6
2.5
1.6
4.6
1.8
2.8
14
13
12
11
10
9
8
H.DRIVE
H.OSC
AFC
VIDEO AMP /MIX
SYNC SEP
VSYNC SEP
IC951 AN2512S
V.OUT
V.OSC
1
2
3
4
5
6
7
2.1
4.9
2.1
1.1
2
R962
47K
1/10W (1%)
C958
0.1
CHIP-FILM
R963
270k
TH951
500
R964
100
R976
1.8K
R965
4.7
V SIZE
RV952
470
JL956
JL957
CN952 (WHT)
1 DV1
2 DV2
DY
L901
DEFLECTION
YOKE
V901
PICTURE
TUBE
M01JYZ60WB
RD
51
ES

- Signal path

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC				
PB		⇨		

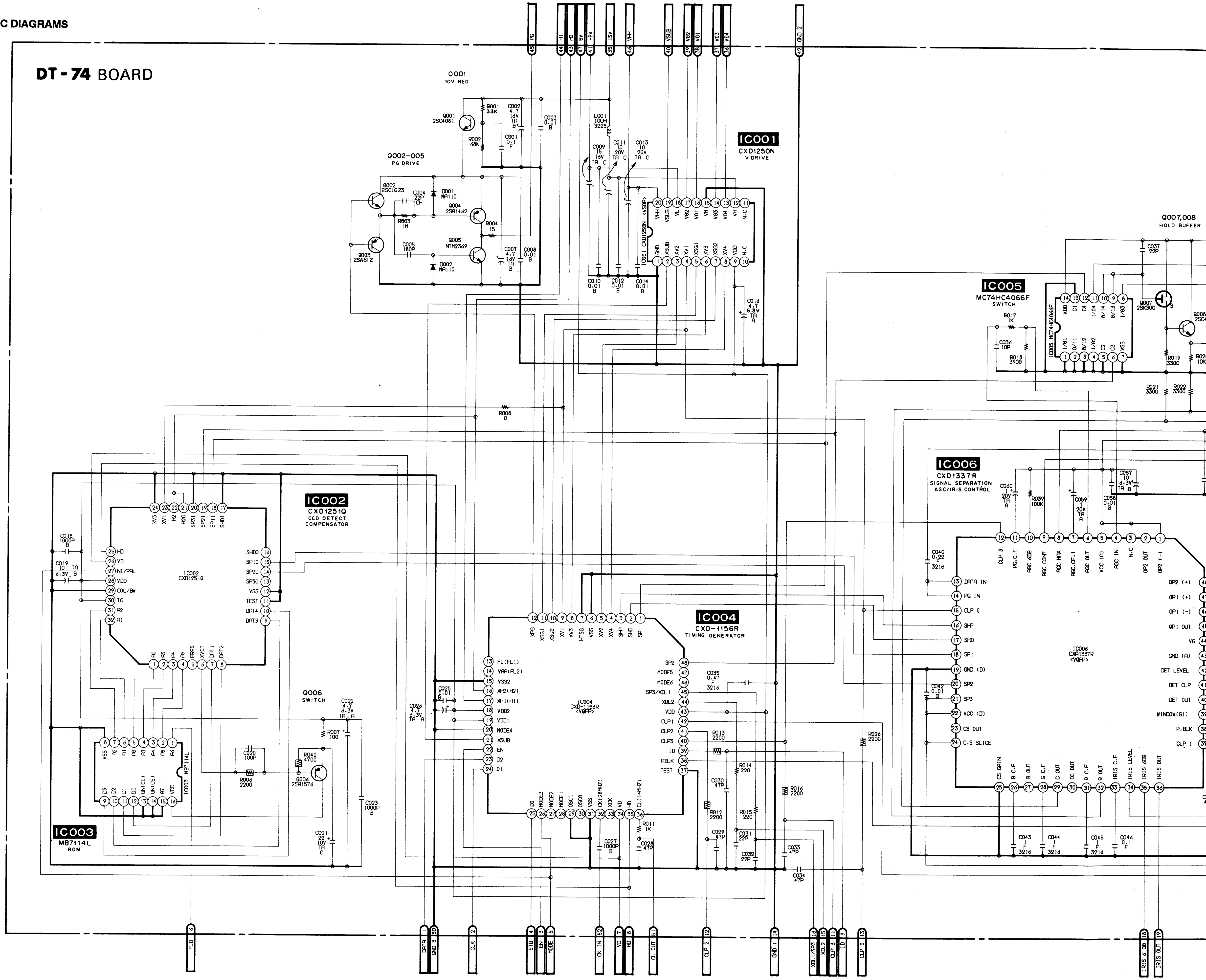
VF-19 BOARD



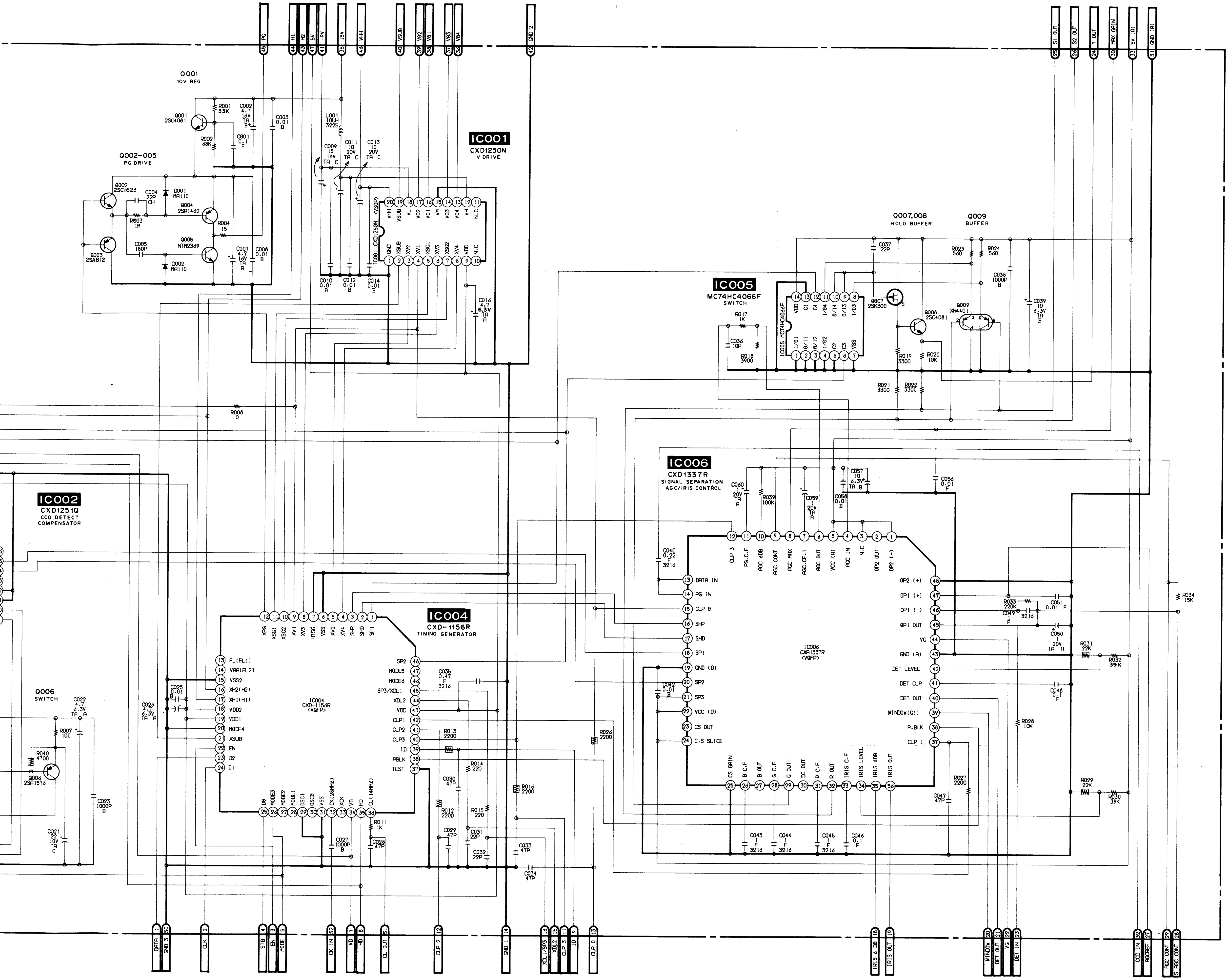
DT-74 (CCD DRIVE, TIMING GENERATOR) SCHEMATIC DIAGRAMS

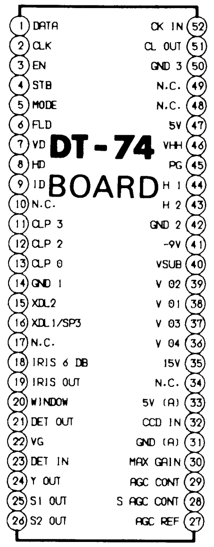
Reference schematic diagram of DT-74 board

DT-74 board is replaced as a block, so that the PRINTED WIRING BOARD of it is omitted.



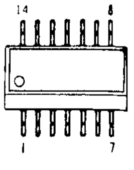
DT-74 BOARD
Q001 10V REG
Q001 2SC4081
R001 33K
C002 4.7 16V TA B
C003 0.01 B
R002 68K
C001 0.1 F
L001 10UH 3225
C009 15 16V TA C
C011 10 20V TA C
C013 10 20V TA C
Q002-005 PG DRIVE
Q002 2SC1623
C004 22P CH
D001 MA110
Q004 2SA1462
R003 1M
R004 15
Q005 NTM2369
Q003 2SA812
C005 180P
D002 MA110
C007 4.7 16V TA B
C008 0.01 B
IC001 CXD1250N V DRIVE
VHH VSUB VL VO2 VO1 VM VO3 VO4 VH N.C
GND XSUB XV2 XV1 XSG1 XV3 XSG2 XV4 VDD N.C
C010 0.01 B
C012 0.01 B
C014 0.01 B
C016 4.7 6.3V TA A
Q007,008 HOLD BUFFER
C037 22P
IC005 MC74HC4066F SWITCH
R017 1K
C036 10P
R018 3900
Q007 2SK300
Q008
R019 3300
R020 10K
R021 3300
R022 3300
R008 0
IC006 CXD1337R SIGNAL SEPARATION AGC/IRIS CONTROL
C060 20V TA
R039 100K
C059 20V TA
C058 0.01 B
C057 10 6.3V TA B
C040 0.22 F 3216
DATA IN, PG IN, CLP 0, SHP, SHD, SP1, GND (D), SP2, SP3, VCC (D), CS OUT, C.S SLICE
CLP 3, PG.C.F, AGC 6DB, AGC CONT, AGC MAX, AGC.CF.1, AGC OUT, VCC (A), AGC IN, N.C, OP2 OUT, OP2 (-)
OP2 (+), OP1 (+), OP1 (-), OP1 OUT, VG, GND (A), DET LEVEL, DET CLP, DET OUT, WINDOW(G1), P.BLK, CLP 1
CS GAIN, B C.F, B OUT, G C.F, G OUT, DC OUT, R C.F, R OUT, IRIS C.F, IRIS LEVEL, IRIS 6DB, IRIS OUT
IC006 CXA1337R <VQFP>
C042 0.01 B
C043 F 3216
C044 F 3216
C045 F 3216
C046 0.1 F
IC002 CXD1251Q CCD DETECT COMPENSATOR
XV3 XV1 H2 H2G SP31 SP21 SP11 SHD1
HD VD NT/PAL VDD COL/BW TG A2 A1
SHD0 SP10 SP20 SP30 VSS TEST DAT4 DAT3
A0 A3 A4 A5 FREQ XVCT DAT1 DAT2
C018 1000P B
C019 10 TA 6.3V B
IC003 MB7114L ROM
VSS A2 A1 A0 A3 A4 A6 D3 D2 D1 D0 UN(CE) UN(CE) A7 VCC
Q006 SWITCH
C022 4.7 6.3V TA A
R007 100
C020 100P
R006 2200
R040 4700
Q006 2SA1576
C023 1000P B
C021 22 10V TA C
IC004 CXD-1156R TIMING GENERATOR
XPG XSG1 XSG2 XV1 XV3 HTSG VSS XV2 XV4 SHP SHD SP1
FL(FL1) VAR(FL2) VSS2 XH2(H2) XH1(H1) VDD2 VDD1 MODE4 XSUB EN D2 D1
SP2 MODE5 MODE6 SP3/XDL1 XDL2 VDD CLP1 CLP2 CLP3 ID PBLK TEST
D0 MODE3 MODE2 MODE1 OSC1 OSC0 VSS CK(28MHZ) XCK VD HD CL(14MHZ)
IC004 CXD-1156R <VQFP>
C025 0.01 F
C026 4.7 6.3V TA A
C035 0.47 F 3216
R013 2200
R014 220
C030 47P
R012 2200
R015 220
C029 47P
C031 22P
C032 22P
R011 1K
C027 1000P B
C028 47P
C033 47P
C034 47P
R016 2200
R026 2200
45 PG, 44 H1, 43 H2, 41 5V, 47 -9V, 35 15V, 46 VHH, 40 VSUB, 39 VO2, 38 VO1, 37 VO3, 36 VO4, 42 GND 2
6 FLD, 1 DATA, 50 GND 3, 2 CLK, 4 STB, 3 EN, 5 MODE, 52 CK IN, 7 VD, 8 HD, 51 CL OUT, 12 CLP 2, 14 GND 1, 16 XDL1/SP3, 15 XDL2, 11 CLP 3, 10 ID, 13 CLP 0, 18 IRIS 6 DB, 19 IRIS OUT


IC001
CXD1250N
V DRIVE
IC002
CXD1251Q
CCD DETECT COMPENSATOR
IC004
CXD-1156R
TIMING GENERATOR
IC005
MC74HC4066F
SWITCH
IC006
CXD1337R
SIGNAL SEPARATION AGC/IRIS CONTROL
Q001
10V REG
Q002-005
PG DRIVE
Q006
SWITCH
Q007,008
HOLD BUFFER
Q009
BUFFER
Q001 2SC4081
Q002 2SC1623
Q003 2SA812
Q004 2SA1462
Q005 NTM2369
Q006 2SA1576
Q007 2SK300
Q008 2SC4081
Q009 XN4401
D001 MA110
D002 MA110
L001 10UH 3225
PG
H1
H2
5V
-9V
15V
VHH
VSUB
V02
V01
V03
V04
GND 2
S1 OUT
S2 OUT
Y OUT
MAX GAIN
5V (A)
GND (A)
DATA
GND 3
CLK
STB
EN
MODE
CK IN
VD
HD
CL OUT
CLP 2
GND 1
XDL1/SP3
XDL2
CLP 3
ID
CLP 0
IRIS 6 DB
IRIS OUT
WINDOW
DET OUT
VG
DET IN
CCD IN
AGCREF
AGC CONT
S AGC CONT


DT-74
BOARD
1 DATA
2 CLK
3 EN
4 STB
5 MODE
6 FLD
7 VD
8 HD
9 ID
10 N.C.
11 CLP 3
12 CLP 2
13 CLP 0
14 GND 1
15 XDL2
16 XDL1/SP3
17 N.C.
18 IRIS 6 DB
19 IRIS OUT
20 WINDOW
21 DET OUT
22 VG
23 DET IN
24 Y OUT
25 S1 OUT
26 S2 OUT
52 CK IN
51 CL OUT
50 GND 3
49 N.C.
48 N.C.
47 5V
46 VHH
45 PG
44 H 1
43 H 2
42 GND 2
41 -9V
40 VSUB
39 V 02
38 V 01
37 V 03
36 V 04
35 15V
34 N.C.
33 5V (A)
32 CCD IN
31 GND (A)
30 MAX GAIN
29 AGC CONT
28 S AGC CONT
27 AGC REF

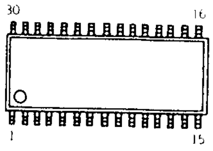
4-3. SEMICONDUCTORS

AN2512S



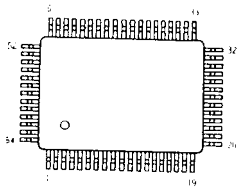
(TOP VIEW)

CXA1047M
CXA1127M



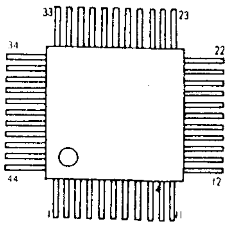
(Top view)

CXA1200BQ
µPD7503GF-J36-3B8

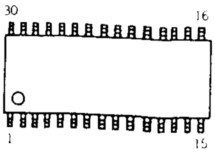


TOP VIEW

CXA1204Q

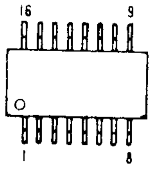

33
23
34
22
44
12
1
11

CXA1206N
CXL1501M



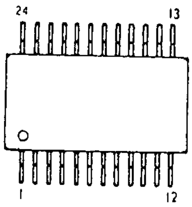
(Top view)

CXD1172M-T1
TK10500M



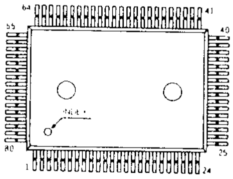
(TOP VIEW)

CXL1503N
CXL1504N



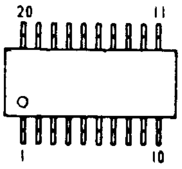
(TOP VIEW)

CXP80116-163Q


64
41
65
40
80
25
1
24

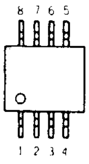
MARKING SIDE VIEW

JSCQ38507SD02R
MB88341PFV



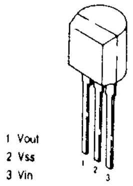
(TOP VIEW)

RC3414M
µPC1037GR-T1

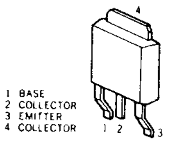


(TOP VIEW)

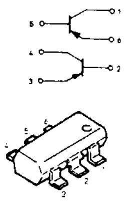
S-81350AG-REG


1 Vout
2 Vss
3 Vin
1
2
3

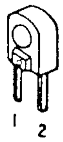
2SB1202FAS


1 BASE
2 COLLECTOR
3 EMITTER
4 COLLECTOR
4
1
2
3

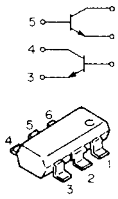
IMT1US
XN4111
XN4113



PT4850F



XN4210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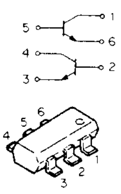
1
6
4
3
2
4
5
6
1
2
3

XN4213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1
6
4
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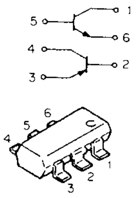
4
5
6
1
2
3

XN4601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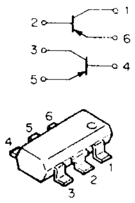
6
1
2
3

XN6401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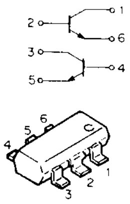
3

XN6215
XN6501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5
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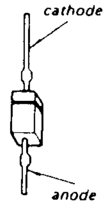
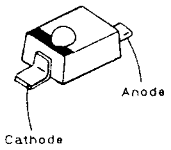
1
2
3

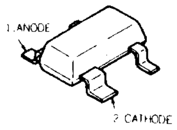
1SS283


cathode
anode

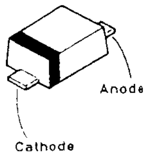
1T32
1T33C-01


Anode
Cathode

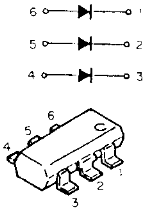
GL1HD51


1 ANODE
2 CATHODE

MA110
MA111


Anode
Cathode

MA121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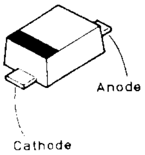
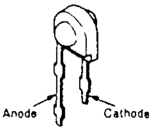
MA8082-M


Anode
Cathode

GL453


Anode
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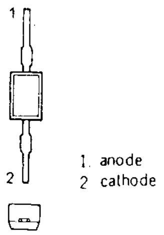
TLS221


1
2
1. anode
2. cathode

SECTION 5

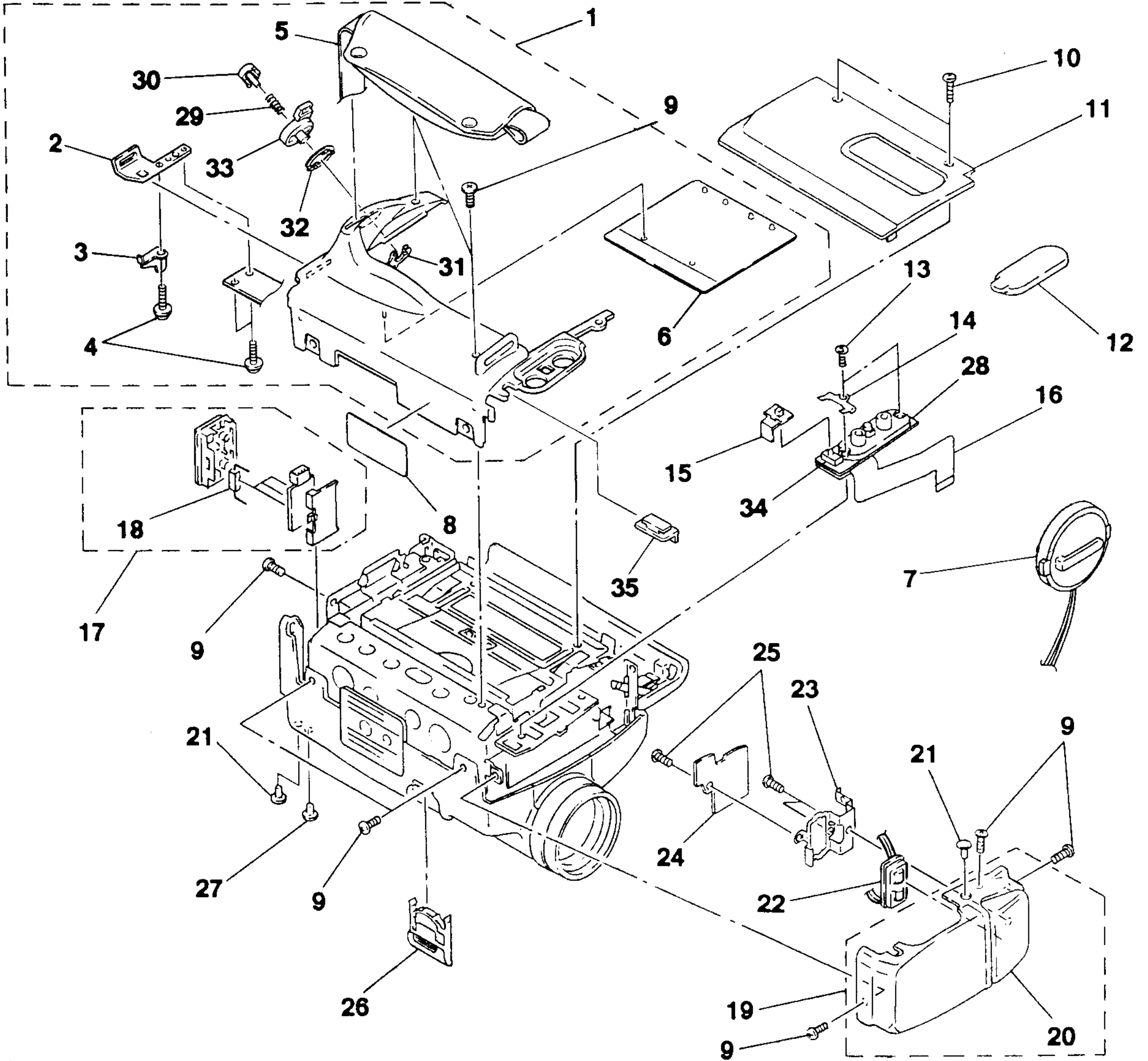
EXPLODED VIEWS

NOTE:

- –XX, –X mean standardized parts, so they may have some differences from the original one.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

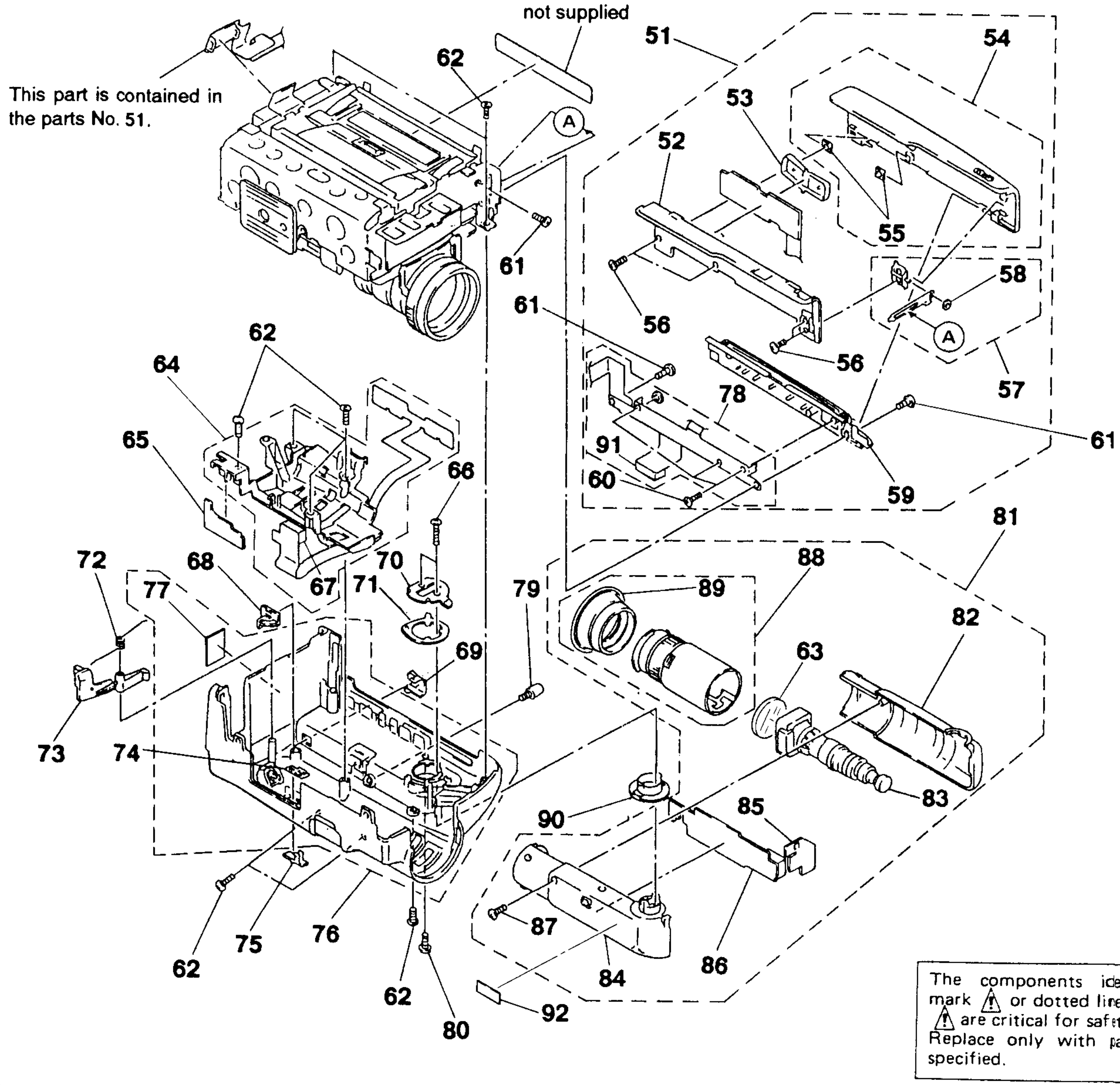
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

5-1. CABINET (LEFT) ASSENBLY



No.	Part No.	Description	Remark
1	A-7080-874-A	CABINET (LEFT) BLOCK ASSY (E/Australian)	2-7, 29-33
	A-7080-959-A	CABINET (LEFT) BLOCK ASSY (AEP/UK MODEL)	2-7, 29-33
2	3-736-338-01	BRACKET, BELT	
3	3-736-360-01	JOINT, LR	
4	3-669-480-11	+ PTPWH 2	
5	3-736-807-01	BELT, GRIP	
6	3-736-328-01	COVER, DRUM	
7	A-7091-015-A	CAP ASSY, LENS	
8	*3-736-886-01	LABEL, MODEL NUMBER (AEP) (AEP MODEL)	
	*3-740-512-01	LABEL, MODEL NUMBER(UK)(UK/E/Australian)	
9	3-719-381-01	SCREW (M2X4)	
10	3-727-902-11	SCREW (M1.4), SPECIAL	
11	X-3736-381-1	LID ASSY, CASSETTE	
12	3-736-820-01	COVER, JACK	
13	3-719-695-31	SCREW (M1.7X4.5), SPECIAL HEAD	
14	3-736-354-01	PLATE, GROUND, PJ SWITCH (E/Australian)	
15	3-736-355-01	KNOB, IN OUT (E/Australian MODEL)	
16	1-630-589-11	JK-40 FLEXIBLE BOARD	
17	⚠.1-537-217-21	TERMINAL BOARD, BATTERY	18
18	⚠.1-532-841-21	LINK, IC	
19	X-3736-336-1	PANEL ASSY, F (E/Australian MODEL)	20
	X-3736-380-1	PANEL ASSY, F (AEP/UK MODEL)	20
20	X-3736-314-1	GRILLE ASSY, MICROPHONE	
21	3-728-267-01	COVER, 3.5 JACK (EARPHONE/MIC)	
22	1-542-126-11	MICROPHONE UNIT	
23	3-736-801-01	PLATE, GROUND, MICROPHONE	
24	*A-7070-969-A	MA-32 BOARD, COMPLETE	
25	3-719-601-01	SCREW (B2X5), TAPPING	
26	X-3736-303-1	LID ASSY, BATTERY CASE, LITHIUM	
27	3-728-266-01	COVER, 2.5 JACK (REMOTE)	
28	1-537-142-11	TERMINAL BOARD (J901)	
29	3-578-221-00	SPRING, COMPRESSION	
30	3-736-343-01	BUTTON, S/S	
31	3-736-344-01	HOLDER, STAND-BY KNOB	
32	3-736-364-01	SPRING	
33	3-736-391-01	KNOB, STAND-BY	
34	1-570-134-11	SWITCH, SLIDE (S921)	
35	3-736-894-01	COVER, OUTPUT (AEP/UK MODEL)	

5-2. CABINET (RIGHT) ASSEMBLY

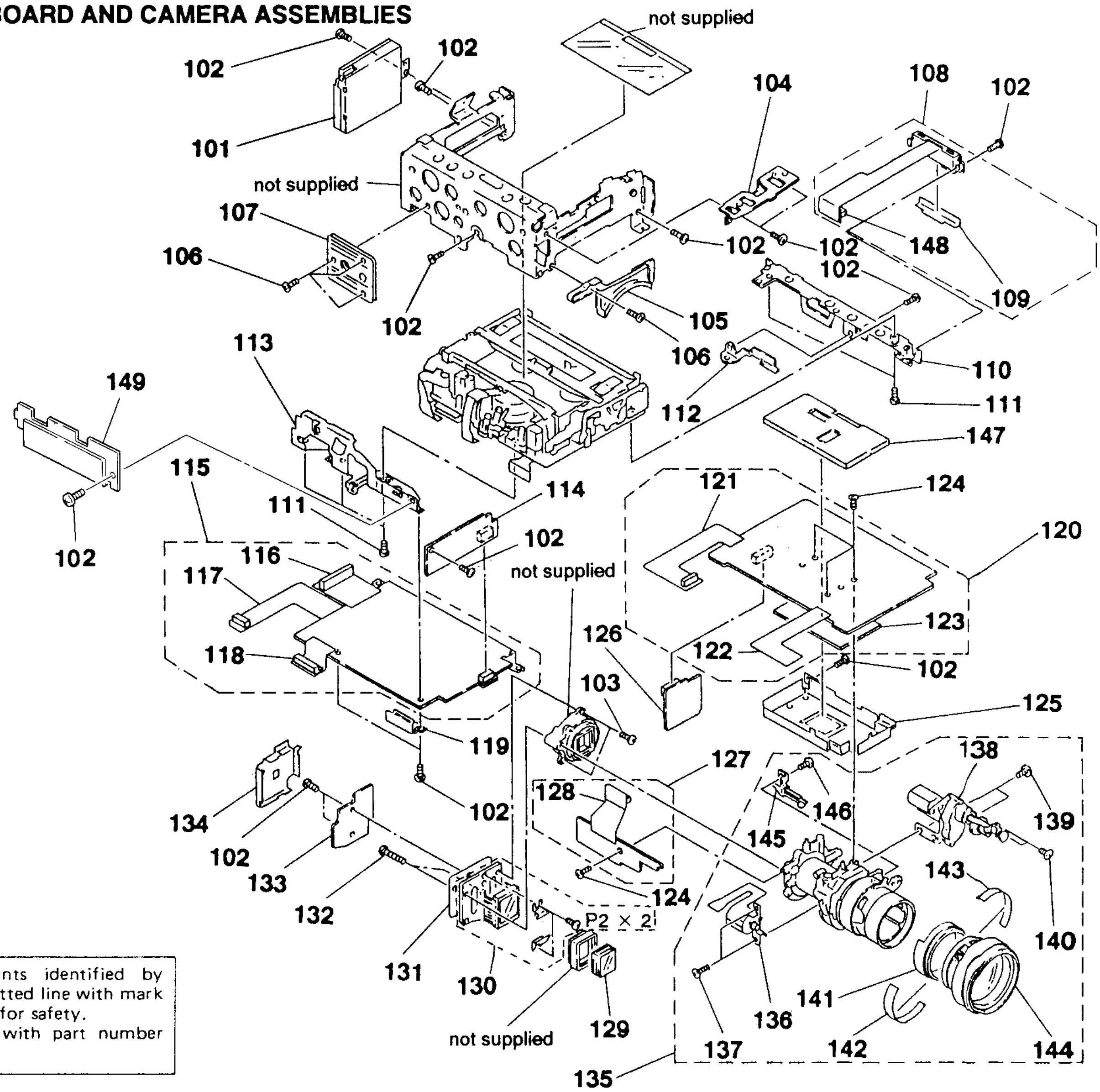


The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

No.	Part No.	Description	Remark
51	1-466-146-41	SWITCH BLOCK, CONTROL (E/Australian)	52-60, 78
	1-466-234-11	SWITCH BLOCK, CONTROL (AEP/UK MODEL)	52-60, 78
52	X-3736-315-1	LID (REAR) ASSY, GRIP	
53	*3-736-376-01	BUTTON, ZOOM	
54	X-3736-338-1	LID (FRONT) ASSY, GRIP	55
55	3-716-418-01	NUT, FRAME PLATE	
56	3-736-362-01	SCREW (M1.7X3), 0 P2	
57	A-7091-018-A	LEVER BLOCK ASSY, LID	58
58	3-701-436-11	WASHER, 1.6 POLYETHYLENE	
59	X-3736-335-1	PANEL ASSY, VTR (E/Australian MODEL)	
	X-3736-382-1	PANEL ASSY, VTR (AEP/UK MODEL)	
60	3-736-363-01	SCREW (2X6), TAPPING, 0 K1	
61	3-713-786-51	SCREW (M2X3)	
62	3-719-408-01	SCREW (B2), TAPPING, P3	
63	*3-740-513-01	COVER, PLATE	
64	1-466-147-11	SWITCH BLOCK, CF-4	67
65	*A-7070-968-A	EL-1 BOARD, COMPLETE	
66	3-719-381-41	SCREW (M2X10)	
67	1-568-334-11	CONNECTOR, BOARD TO BOARD 16P (CF-4 SWITCH BLOCK CN751)	
68	3-736-389-01	SLIDER, RELEASE	
69	3-736-387-01	BUTTON, BATTERY RELEASE	
70	3-736-334-01	PLATE, LOCK, TILT	
71	3-736-333-01	SPRING, LEAF	
72	3-736-828-01	SPRING	
73	3-736-388-01	LEVER, RELEASE	
74	3-736-386-01	SLIDER, AUTO LOCK	
75	3-736-385-01	BUTTON, AUTO LOCK	
76	X-3736-383-1	CABINET (R) ASSY	77
77	*3-719-683-01	LABEL, BATTERY FITTING	
78	1-466-146-11	SWITCH BLOCK, FK-9 (E/Australian)	91
	1-466-149-21	SWITCH BLOCK, FK-9 (AEP/UK MODEL)	91
79	3-736-822-01	SCREW, GUIDE	
80	3-719-381-01	SCREW (M2X4)	
81	A-7019-177-A	EVF COMPLETE ASSY	63, 82-89
82	X-3736-304-1	CABINET (UPPER) ASSY, EVF	
83	⚠.1-452-482-31	CRT ASSY (M91JYZ60WB) (V901)	
84	X-3736-305-1	CABINET (LOWER) ASSY, EVF	
85	*1-630-588-21	TL-26 BOARD	
86	*A-7061-853-A	VF-19 BOARD, COMPLETE	
87	3-713-790-31	SCREW (M2X8), TAPPING, P3	
88	A-7080-872-A	HOLDER BLOCK ASSY, FINDER	89
89	3-736-370-01	EYE CUP	
90	3-724-514-01	SLEEVE, EVF	
91	1-568-335-11	CONNECTOR, BOARD TO BOARD 18P (FK-9 SWITCH BLOCK CN603)	
92	*3-704-235-01	LABEL, CAUTION (UK MODEL)	

Be sure to read "Precautions for Replacement of CCD Imager" on page 154 when changing the CCD imager.

5-3. MAIN BOARD AND CAMERA ASSEMBLIES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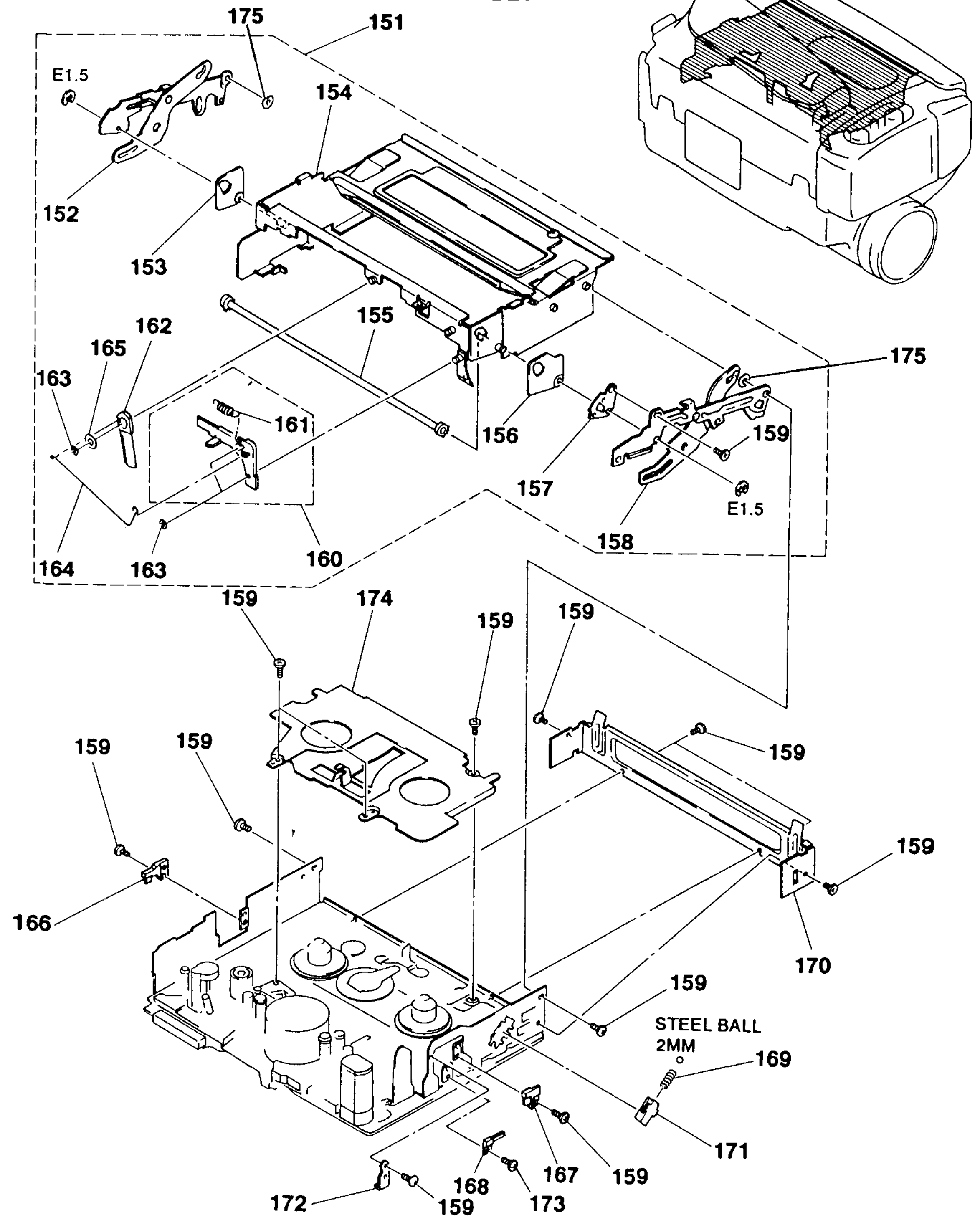
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

No.	Part No.	Description	Remark
101	⚠.1-466-148-21	CONVERTER UNIT, DC-DC	
102	3-713-786-51	SCREW (M2X3)	
103	3-738-519-01	SCREW (M2X3), +B	
104	*X-3736-311-1	BRACKET ASSY, PJ	
105	3-736-392-01	PANEL, SUB	
106	3-719-381-01	SCREW (M2X4)	
107	3-736-396-01	SCREW, TRIPOD	
108	⚠.1-808-753-11	DISPLAY BLOCK, LIQUID CRYSTAL	109, 148
109	*3-736-832-01	COVER, PROTECTION, LCD	
110	3-736-803-01	SHEET METAL (F), MD FITTING	
111	3-704-197-21	SCREW (M1.4X2.5), LOCKING	
112	3-736-365-01	REINFORCEMENT, LCD	
113	3-736-804-01	SHEET METAL (R), MD FITTING	
114	*A-7061-848-A	AU-51 BOARD, COMPLETE	
115	*A-7061-847-A	VS-37 BOARD, COMPLETE (AEP/UK)	116-118
115	*A-7061-914-A	VS-37 BOARD, COMPLETE (E/Australian)	116-118
116	1-630-590-11	FP-181 FLEXIBLE BOARD	
117	1-630-592-11	FP-184 FLEXIBLE BOARD	
118	1-630-591-11	FP-182 FLEXIBLE BOARD	
119	3-736-323-01	SHIELD, RP CONNECTOR	
120	*A-7061-851-A	VC-60 BOARD, COMPLETE	121-123
121	1-630-594-11	FP-186 FLEXIBLE BOARD	
122	1-630-593-11	FP-185 FLEXIBLE BOARD	
123	A-7068-153-A	DT-74 BOARD, COMPLETE (HIC)	
124	3-719-601-01	SCREW (B2X5), TAPPING	
125	*3-736-319-01	CASE (UPPER), VC SHIELD	
126	*A-7061-850-A	TI-15 BOARD, COMPLETE	
127	*A-7061-849-A	LD-11 BOARD, COMPLETE	128
128	1-630-595-11	FP-187 FLEXIBLE BOARD	
129	A-7090-879-A	FILTER BLOCK KIT, OPTICAL (OFB-02-02)	
130	A-7091-132-A	IC ICX027BK-2 ASSY (CCD IMAGER)	
131	*3-725-180-01	SHEET, INSULATING, CCD HOLDER	
132	3-335-640-51	SCREW (M2X16)	
133	*A-7070-966-A	CD-14 BOARD, COMPLETE	
134	*3-736-321-01	CASE, CCD SHIELD	
135	1-547-335-11	LENS, ZOOM (VCL-1106XA)	136-146
136	3-707-660-01	METER ASSY, EE (IRIS) (M904)	
137	3-707-665-01	SCREW, (B) 3P 1.7X4C	
138	3-707-659-01	MOTOR ASSY, AF/Z GEAR (FOCUS/ZOOM)(M905)	
139	3-707-663-01	SCREW, FITTING	
140	3-707-666-01	SCREW, (B) 3P 1.7X2.8C	
141	3-707-656-01	RING, (F) SCALE	
142	3-707-657-01	TAPE, DISTANCE SCALE FITTING	
143	3-707-658-01	TAPE, DISTANCE SCALE SUPPORT	
144	3-707-661-01	RING UNIT, F	
145	3-707-662-01	SW ASSY, LEAF (FOCUS END SWITCH) (S901)	
146	3-707-664-01	SCREW, (B) 2P 1.7X4.5C	
147	*X-3736-313-1	CASE (LOWER) ASSY, SHIELD, VC	
148	1-568-335-11	CONNECTOR, BOARD TO BOARD 13P	
149	*A-7061-855-A	PD-18 BOARD, COMPLETE	

5-4. CASSETTE COMPARTMENT HOLDER ASSEMBLY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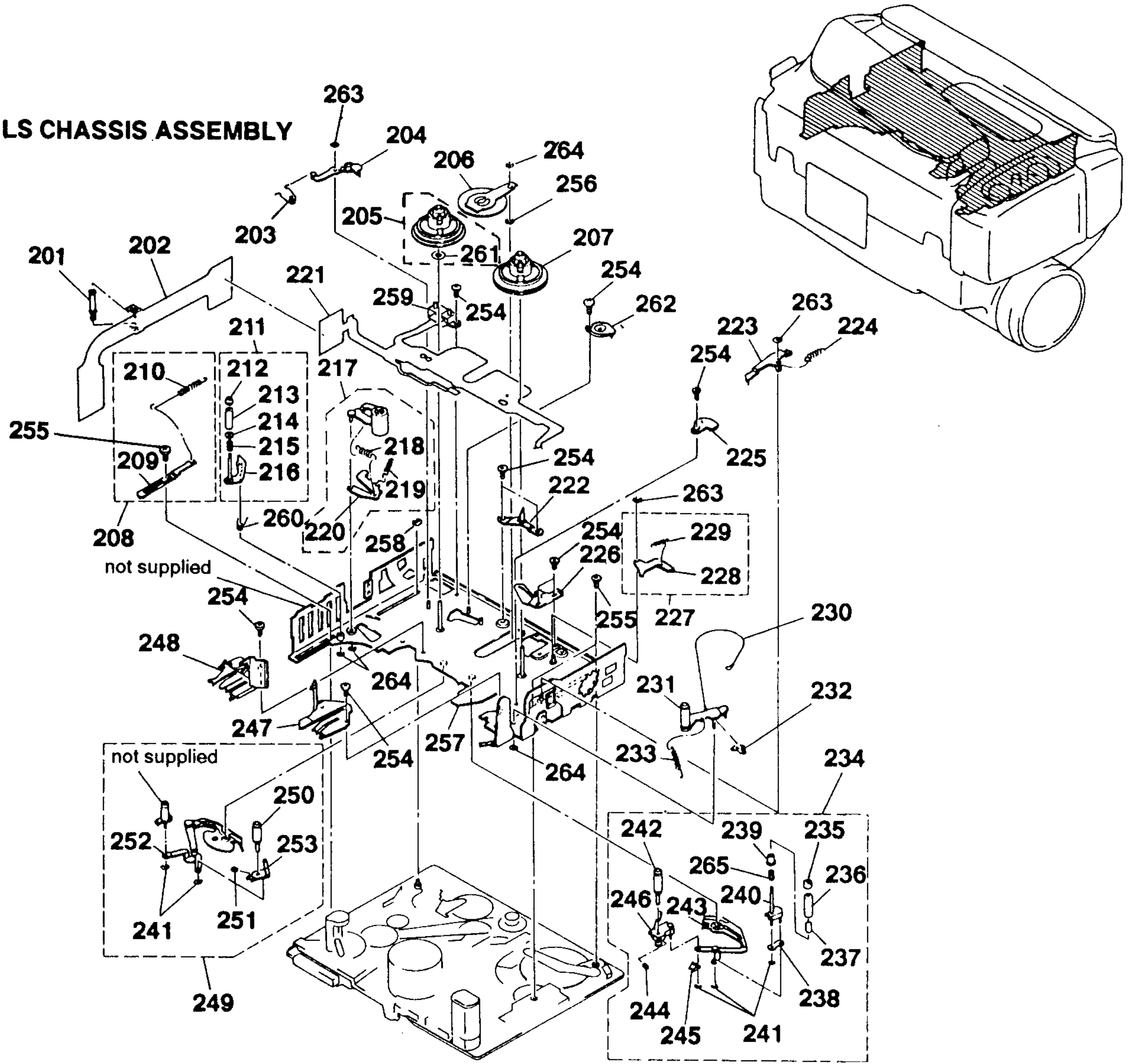
No.	Part No.	Description	Remark
151	*A-7040-156-L	HOLDER BLOCK ASSY	152-165
152	X-3727-937-5	ARM (T) ASSY, F	
153	3-728-145-01	BEARING (T), MIDWAY GEAR	
154	X-3727-950-2	HOLDER ASSY	
155	X-3727-920-1	GEAR ASSY, MIDWAY	
156	3-728-146-01	BEARING (S), MIDWAY GEAR	
157	3-727-992-01	PLATE, ADJUSTMENT, C ARM	
158	X-3727-938-6	ARM (S) ASSY, F	
159	3-728-103-01	SCREW (M1.4X1.6), SPECIAL HEAD	
160	A-7040-164-A	ARM BLOCK ASSY, TP	161
161	3-667-309-00	SPRING, TENSION	
162	X-3727-922-2	PROTECTOR ASSY, T	
163	3-331-007-11	WASHER	
164	3-728-277-01	BAR, JOINT	
165	3-728-278-01	WASHER	
166	3-727-954-01	HOLDER (T), SENSOR	
167	3-727-957-01	HOLDER (S), SENSOR	
168	1-554-938-11	SWITCH, LEAF (S991)	
169	3-727-935-01	SPRING, COMPRESSION	
170	3-736-808-03	FRAME (2), LS	
171	3-727-973-01	HOLDER, BS	
172	3-727-946-01	SUPPORT, LS	
173	3-728-148-01	SCREW (M1.4X2.5), SPECIAL HEAD	
174	3-728-227-01	BASE, LED	
175	3-727-993-01	SHAFT (A), ARM	

5-5. LS CHASSIS ASSEMBLY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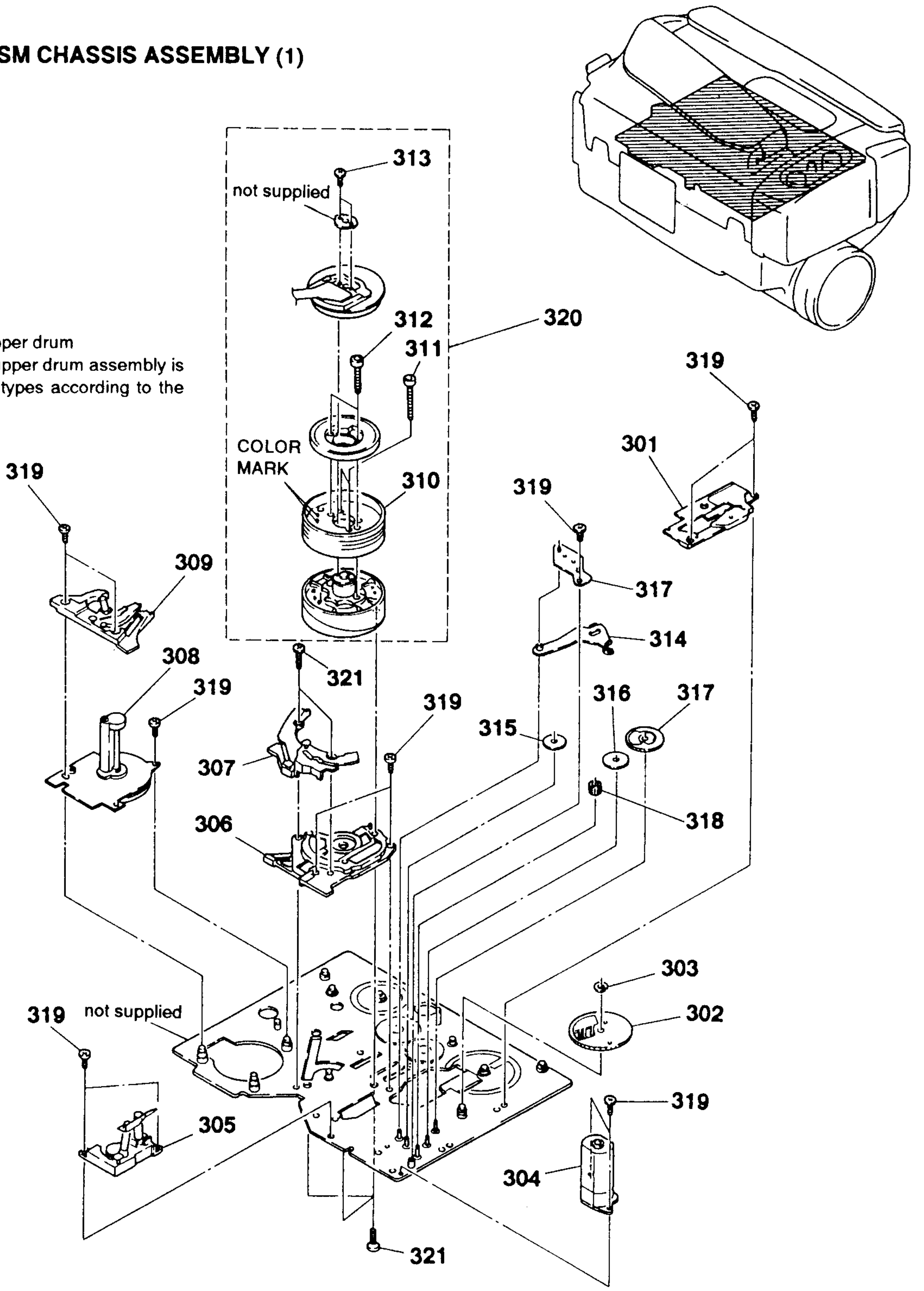
No.	Part No.	Description	Remark
201	3-739-807-01	SHAFT (2), FLEXIBLE ROTARY	
202	1-627-722-11	FP-149 FLEXIBLE BOARD	
203	3-728-066-01	SPRING	
204	X-3727-927-1	RATCHET ASSY, T	
205	X-3727-951-2	TABLE ASSY, REEL, TAKE-UP	261
206	X-3727-926-1	ARM ASSY, GEAR	
207	X-3727-952-1	TABLE ASSY, REEL, SUPPLY	
208	A-7040-150-A	SLIDER BLOCK ASSY, CAM	209, 210
209	3-728-089-01	SLIDER, CAM	
210	3-727-936-01	SPRING, TENSION	
211	A-7040-151-A	ARM BLOCK ASSY, TG11	212-216
212	3-728-131-02	FLANGE, UPPER, TG11	
213	3-728-133-02	SLEEVE, TG11	
214	3-728-069-02	FLANGE, LOWER, TG11	
215	3-732-040-01	SPRING, COMPRESSION	
216	X-3727-913-2	ARM ASSY, TG11	
217	A-7040-146-D	ARM BLOCK ASSY, PINCH	218-220
218	3-727-927-01	SPRING (POWER TENSION), TENSION	
219	3-727-928-01	SPRING, TENSION	
220	X-3727-929-2	ARM ASSY, LIMITER	
221	*A-7061-238-A	FP-115 BOARD, COMPLETE	
222	X-3727-928-3	BASE ASSY, RL	
223	3-728-201-01	RATCHET, S	
224	3-728-121-01	SPRING, TENSION	
225	3-728-200-01	ADJUSTMENT BLOCK, TG1	
226	3-728-206-01	PLATE, CAM, LS	
227	A-7040-158-C	ARM BLOCK ASSY, S SOFT	228, 229
228	3-728-205-01	ARM, S SOFT	
229	3-728-072-01	SPRING, TENSION	
230	X-3727-923-2	STRING ASSY	
231	X-3727-946-3	ARM ASSY, TG1	
232	3-728-124-01	HOLDER, JOINT	
233	3-728-071-01	SPRING, TENSION	
234	A-7040-149-A	ARM (S) BLOCK ASSY, GUIDE	235-246, 265
235	3-728-037-01	FLANGE, UPPER, TG4	
236	3-728-049-01	ROLLER, TG4	
237	3-728-048-01	SLEEVE, TG4	
238	3-728-053-01	PLATE, UNDER, TG4	
239	3-728-047-01	FLANGE, LOWER, TG4	
240	X-3727-936-2	BASE ASSY, TG4	
241	3-331-007-11	WASHER	
242	X-3727-935-2	ROLLER ASSY, TG5	
243	X-3727-941-1	ARM (S) ASSY, GUIDE	
244	3-728-289-01	SCREW (M1.2)	
245	3-728-062-01	SPRING (6GB), LEAF	
246	X-3727-948-1	BASE ASSY, TG6	
247	3-728-226-01	RAIL (S), GUIDE	
248	3-728-244-01	RAIL (T), GUIDE	
249	A-7040-148-A	ARM (T) BLOCK ASSY, GUIDE	241, 250-253
250	X-3727-994-1	ROLLER ASSY, TG8	
251	3-728-290-01	SCREW (M1.2)	
252	X-3727-940-1	ARM (T) ASSY, GUIDE	
253	X-3727-947-1	BASE ASSY, TG7	
254	3-728-103-01	SCREW (M1.4X1.6), SPECIAL HEAD	
255	3-728-126-01	SCREW (M1.4X2), SPECIAL HEAD	
256	3-321-394-11	WASHER	
257	X-3727-993-1	CHASSIS ASSY, LS	
258	3-578-254-00	RING, RETAINING, E1.2	
259	1-571-647-11	SWITCH, PUSH (2 KEY) (S992)	
260	3-727-939-01	SPRING, TORSION	
261	3-701-439-11	WASHER	
262	X-3727-914-1	CLUTCH ASSY, ONEWAY	
263	3-728-091-01	WASHER, STOPPER	
264	3-315-414-31	WASHER	
265	3-728-023-01	SPRING, COMPRESSION	

5-6. MECHANISM CHASSIS ASSEMBLY (1)

Note: For rotating upper drum
The rrotating upper drum assembly is divided into 2 types according to the color mark.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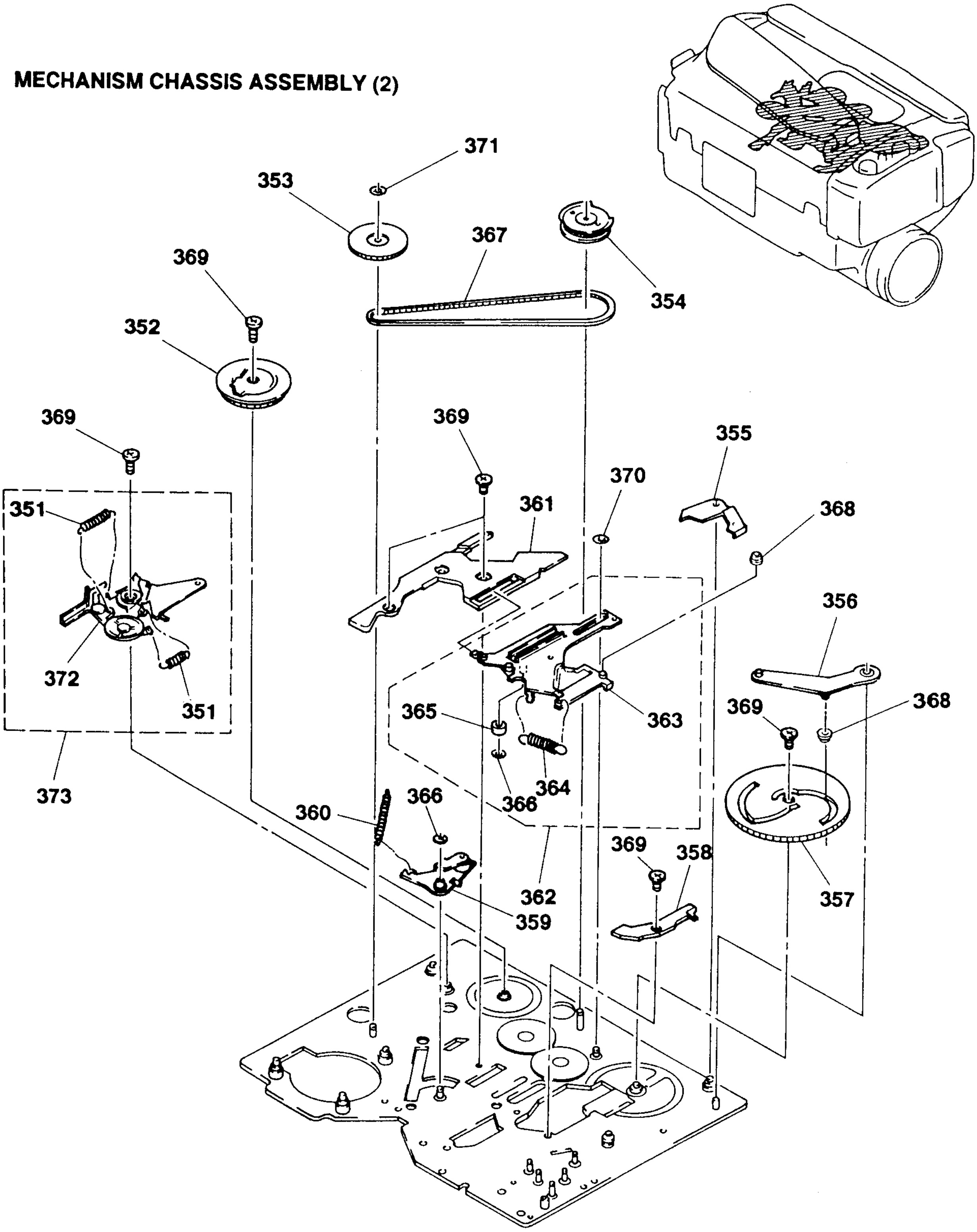
No.	Part No.	Description	Remark
301	3-728-231-01	BASE, TG-1 CAM	
302	X-3727-915-1	GEAR ASSY, MODE	
303	3-325-290-21	WASHER, STOPPER	
304	1-541-607-11	MOTOR, DC (LA12G-344VA) (LOADING) (M903)	
305	A-7040-172-D	BASE (1) BLOCK ASSY, RAIL	
306	X-3727-949-1	BASE ASSY, DRUM	
307	A-7040-171-C	BASE (2) BLOCK ASSY, GUIDE RAIL	
308	8-835-329-01	MOTOR, DC U-21A (CAPSTAN) (M902)	
309	X-3727-933-3	BASE (3) ASSY, GUIDE RAIL	
310	A-7049-198-A	DRUM ASSY, UPPER, ROTARY (DGR-37-R-(2)) MARKING; RED, BLUE, REDDISH-BROWN OR BLUISH-BROWN	
310	A-7049-197-A	DRUM ASSY, UPPER, ROTARY (DGR-37-R-(1)) MARKING; GREEN, BLACK, GREENISH-BROWN OR BLACKISH-BROWN	
311	3-727-809-01	SCREW (M1.4X5), HEXAGONAL HOLE	
312	3-727-807-01	SCREW (M1.7X3.3), HEXAGONAL HOLE	
313	3-728-108-21	SCREW (M1.4X2.7)	
314	X-3727-906-1	ARM ASSY	
315	X-3727-903-1	GEAR ASSY, NO.1	
316	X-3727-904-1	GEAR ASSY, NO.2	
317	3-728-119-01	RETAINER, GEAR	
318	3-728-149-01	GEAR, NO.0	
319	3-728-148-01	SCREW (M1.4X2.5), SPECIAL HEAD	
320	A-7048-214-A	DRUM BLOCK ASSY (DGH-37A-R)(M901)	310-313
321	3-728-108-01	SCREW (M1.4X4.5)	

5-7. MECHANISM CHASSIS ASSEMBLY (2)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No.	Part No.	Description	Remark
351	3-728-065-01	SPRING, TENSION	
352	3-728-190-01	CAM (B)	
353	X-3727-930-1	GEAR ASSY, CONVERSION	
354	X-3727-931-1	PULLEY ASSY, MIDWAY	
355	3-728-154-01	ARM, EJ	
356	X-3727-916-1	ARM ASSY, LS	
357	3-728-208-01	CAM (A)	
358	3-728-213-01	SUPPORT (S), GL	
359	X-3727-924-2	ARM ASSY, GUIDE LOCK	
360	3-728-015-01	SPRING (POWER TENSION), TENSION	
361	3-728-228-03	SUPPORT (T), GL	
362	A-7040-153-A	SLIDER BLOCK ASSY, GL	363-366
363	X-3727-942-1	SLIDER ASSY, GL	
364	3-727-929-01	SPRING (POWER TENSION), TENSION	
365	3-728-144-01	ROLLER, GL	
366	3-331-007-11	WASHER	
367	3-728-212-01	BELT, RELAY	
368	3-728-109-01	ROLLER, LS	
369	3-728-148-01	SCREW (M1.4X2.5), SPECIAL HEAD	
370	3-315-384-31	WASHER, STOPPER	
371	3-728-091-01	WASHER, STOPPER	
372	X-3727-944-1	ARM ASSY, PINCH PRESS	
373	A-7040-152-A	ARM BLOCK ASSY, PINCH PRESS	351, 372

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- −XX, −X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms
  METAL : Metal-film resistor
  METAL OXIDE : Metal Oxide-film resistor
  F : nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, U : μ, for example:
  UA...: μA..., UPA...: μPA...,
  UPB...: μPB..., UPC...: μPC...,
  UPD...: μPD...
- CAPACITORS
  MF : μF, PF : μμF
- COILS
  MMH : mH, UH : μH

Ref.No	Part No.	Description		Remark
	*A-7061-238-A	FP-115 BOARD, COMPLETE (Ref.No 6,000 Series) ***********************		
	3-727-954-01	HOLDER (T), SENSOR		
	3-727-957-01	HOLDER (S), SENSOR		
		DIODE		
D991	8-719-951-03	DIODE GL453		
		TRANSISTOR		
Q991	8-729-907-25	TRANSISTOR PT4850F		
Q992	8-729-907-25	TRANSISTOR PT4850F		
		RESISTOR		
R991	1-216-817-11	METAL GLAZE 470	5%	1/16W
R992	1-216-817-11	METAL GLAZE 470	5%	1/16W
R993	1-216-817-11	METAL GLAZE 470	5%	1/16W
R994	1-216-817-11	METAL GLAZE 470	5%	1/16W
		SWITCH		
S991	1-554-938-11	SWITCH, LEAF (CASSETTE LOCK)		
S992	1-571-647-11	SWITCH, PUSH (2 KEY) (REC PROOF, ME/MP)		
**				
		(Ref.No 5,000 Series)		
	*A-7061-847-A	VS-37 BOARD, COMPLETE (AEP, UK MODEL) **********************		
	*A-7061-914-A	VS-37 BOARD, COMPLETE (E, Australian) *********************		
	1-630-590-11	FP-181 FLEXIBLE BOARD		
	1-630-591-11	FP-182 FLEXIBLE BOARD		
	*3-736-316-01	CASE (UPPER), RP SHIELD		
	*3-736-317-01	CASE (LOWER), RP SHIELD		
	*3-736-322-01	CASE, FE SHIELD		
	*3-736-324-01	PLATE (LEFT), VS GROUND		
	*3-736-325-01	PLATE (RIGHT), VS GROUND		
	*3-736-887-01	PLATE, SHIELD, PAL DELAY LINE		
		CAPACITOR		
C101	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C102	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C104	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C105	1-162-945-11	CERAMIC CHIP 22PF	5%	50V
C106	1-162-945-11	CERAMIC CHIP 22PF	5%	50V
C107	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C108	1-135-161-21	TANTAL. CHIP 22MF	20%	6.3V
C109	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C110	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C111	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C112	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C113	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C114	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V

Ref.No	Part No.	Description		Remark
C115	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C116	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V
C117	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C118	1-162-968-11	CERAMIC CHIP 0.0047MF	10%	50V
C119	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C120	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C121	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C123	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C124	1-162-968-11	CERAMIC CHIP 0.0047MF	10%	50V
C125	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C126	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C127	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C128	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C129	1-162-945-11	CERAMIC CHIP 22PF	5%	50V
C130	1-162-945-11	CERAMIC CHIP 22PF	5%	50V
C131	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C132	1-135-161-21	TANTAL. CHIP 22MF	20%	6.3V
C133	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C134	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C135	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C136	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C137	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C138	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V
C139	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C140	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V
C141	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C142	1-162-968-11	CERAMIC CHIP 0.0047MF	10%	50V
C143	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C144	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C145	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C146	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C147	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C148	1-162-968-11	CERAMIC CHIP 0.0047MF	10%	50V
C149	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C150	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C151	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C152	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C161	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C162	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C163	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C164	1-135-161-21	TANTAL. CHIP 22MF	20%	6.3V
C165	1-162-948-11	CERAMIC CHIP 39PF	5%	50V
C166	1-162-963-11	CERAMIC CHIP 680PF	10%	50V
C167	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C168	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C169	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C170	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C171	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C172	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C173	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C174	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C175	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C176	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V

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Ref.No	Part No.	Description		Remark
C177	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C178	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C179	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C180	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C181	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C182	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C183	1-135-161-21	TANTAL. CHIP 22MF	20%	6.3V
C184	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C185	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C186	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C192	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C193	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C194	1-162-927-11	CERAMIC CHIP 100PF	5%	50V
C195	1-162-927-11	CERAMIC CHIP 100PF	5%	50V
C196	1-164-217-11	CERAMIC CHIP 150PF	0.25PF	50V
C197	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C201	1-135-145-11	TANTAL. CHIP 0.47MF	20%	35V
C203	1-126-205-11	ELECT CHIP 47MF	20%	6.3V
C204	1-124-779-00	ELECT CHIP 10MF	20%	16V
C205	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C206	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C207	1-126-246-11	ELECT CHIP 220MF	20%	4V
C208	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C209	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C210	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C211	1-135-149-21	TANTAL. CHIP 2.2MF	20%	10V
C212	1-135-146-21	TANTAL. CHIP 0.68MF	20%	25V
C213	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C214	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C215	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C216	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C217	1-135-145-11	TANTAL. CHIP 0.47MF	20%	35V
C218	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C219	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C220	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C221	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C222	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C223	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C224	1-162-638-11	CERAMIC CHIP 1MF		16V
C227	1-162-638-11	CERAMIC CHIP 1MF		16V
C229	1-162-638-11	CERAMIC CHIP 1MF		16V
C230	1-162-638-11	CERAMIC CHIP 1MF		16V
C232	1-162-638-11	CERAMIC CHIP 1MF		16V
C233	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V
C234	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C235	1-162-638-11	CERAMIC CHIP 1MF		16V
C236	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C237	1-162-638-11	CERAMIC CHIP 1MF		16V
C238	1-162-638-11	CERAMIC CHIP 1MF		16V
C239	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C240	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C241	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C242	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V
C243	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C244	1-162-638-11	CERAMIC CHIP 1MF		16V
C245	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C246	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V
C247	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C248	1-135-070-00	TANTAL. CHIP 0.1MF	20%	35V
C249	1-162-638-11	CERAMIC CHIP 1MF		16V
C251	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C252	1-162-937-11	CERAMIC CHIP 6PF	0.5PF	50V
C253	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C254	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C256	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C257	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C258	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C259	1-162-945-11	CERAMIC CHIP 22PF	5%	50V
C260	1-162-954-11	CERAMIC CHIP 120PF	5%	50V
C261	1-162-944-11	CERAMIC CHIP 18PF	5%	50V
C262	1-162-962-11	CERAMIC CHIP 470PF	10%	50V
C263	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C264	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C265	1-162-942-11	CERAMIC CHIP 12PF	5%	50V
C266	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C267	1-163-133-00	CERAMIC CHIP 470PF	5%	50V
C268	1-163-131-00	CERAMIC CHIP 390PF	5%	50V
C269	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C270	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C271	1-162-958-11	CERAMIC CHIP 270PF	5%	50V
C272	1-162-945-11	CERAMIC CHIP 22PF	5%	50V
C273	1-162-950-11	CERAMIC CHIP 56PF	5%	50V
C274	1-162-958-11	CERAMIC CHIP 270PF	5%	50V
C275	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C276	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C277	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C278	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C279	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C280	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C281	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C282	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C283	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C284	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C285	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C287	1-162-944-11	CERAMIC CHIP 18PF	5%	50V
C288	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C289	1-135-161-21	TANTAL. CHIP 22MF	20%	10V
C290	1-162-957-11	CERAMIC CHIP 220PF	5%	50V
C291	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C293	1-135-161-21	TANTAL. CHIP 22MF	20%	10V
C294	1-135-145-11	TANTAL. CHIP 0.47MF	20%	35V
C295	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C296	1-162-947-11	CERAMIC CHIP 33PF	5%	50V
C297	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C298	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C299	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description		Remark
C301	1-162-946-11	CERAMIC CHIP 27PF	5%	50V
C302	1-126-205-11	ELECT CHIP 47MF	20%	6.3V
C303	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C304	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C305	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C306	1-163-986-00	CERAMIC CHIP 0.027MF	10%	25V
C307	1-162-952-11	CERAMIC CHIP 82PF	5%	50V
C308	1-162-966-11	CERAMIC CHIP 0.0022MF	10%	50V
C309	1-162-947-11	CERAMIC CHIP 33PF	5%	50V
C310	1-162-949-11	CERAMIC CHIP 47PF	5%	50V
C312	1-162-949-11	CERAMIC CHIP 47PF	5%	50V
C313	1-162-962-11	CERAMIC CHIP 470PF	10%	50V
C314	1-135-161-21	TANTAL. CHIP 22MF	20%	10V
C315	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C316	1-162-948-11	CERAMIC CHIP 39PF	5%	50V
C317	1-162-943-11	CERAMIC CHIP 15PF	5%	50V
C318	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C319	1-162-949-11	CERAMIC CHIP 47PF	5%	50V
C320	1-162-956-11	CERAMIC CHIP 180PF	5%	50V
C321	1-162-999-11	CERAMIC CHIP 91PF	5%	50V
C322	1-162-949-11	CERAMIC CHIP 47PF	5%	50V
C323	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C324	1-162-952-11	CERAMIC CHIP 82PF	5%	50V
C325	1-162-967-11	CERAMIC CHIP 0.0033MF	10%	50V
C326	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C327	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C329	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C330	1-162-939-11	CERAMIC CHIP 8PF	0.5PF	50V
C331	1-162-958-11	CERAMIC CHIP 270PF	5%	50V
C333	1-162-936-11	CERAMIC CHIP 5PF	0.25PF	50V
C334	1-164-227-11	CERAMIC CHIP 0.022MF	10%	25V
C335	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C336	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C337	1-162-942-11	CERAMIC CHIP 12PF	5%	50V
C338	1-164-227-11	CERAMIC CHIP 0.022MF	10%	25V
C340	1-162-948-11	CERAMIC CHIP 39PF	5%	50V
C344	1-162-941-11	CERAMIC CHIP 10PF	0.5PF	50V
C345	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C346	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C347	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C348	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C349	1-163-118-00	CERAMIC CHIP 110PF	5%	50V
C350	1-162-959-11	CERAMIC CHIP 330PF	5%	50V
C351	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C352	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C353	1-135-181-21	TANTAL. CHIP 4.7MF	20%	6.3V
C354	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C355	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C356	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C358	1-162-638-11	CERAMIC CHIP 1MF		16V
C359	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C366	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C371	1-162-954-11	CERAMIC CHIP 120PF	5%	50V

Ref.No	Part No.	Description		Remark
C501	1-136-718-11	TANTAL CHIP 0.1MF	5%	25V
C502	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C503	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C504	1-135-070-00	TANTAL. CHIP 0.1MF	20%	35V
C505	1-163-037-11	CERAMIC CHIP 0.022MF	10%	25V
C506	1-127-561-11	ELECT(SOLID) 33MF	20%	10V
C507	1-127-561-11	ELECT(SOLID) 33MF	20%	10V
C508	1-127-561-11	ELECT(SOLID) 33MF	20%	10V
C509	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C510	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C511	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C512	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C513	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C514	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V
C515	1-135-149-21	TANTAL. CHIP 2.2MF	20%	10V
C516	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C518	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C519	1-162-969-11	CERAMIC CHIP 0.0068MF	10%	25V
C520	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C521	1-162-638-11	CERAMIC CHIP 1MF		16V
C522	1-135-159-21	TANTAL CHIP 10MF	20%	20V
C523	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C524	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C525	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C526	1-163-075-00	CERAMIC CHIP 0.047MF	10%	25V
C527	1-163-037-11	CERAMIC CHIP 0.022MF	10%	25V
C528	1-163-037-11	CERAMIC CHIP 0.022MF	10%	25V
C529	1-163-037-11	CERAMIC CHIP 0.022MF	10%	25V
C542	1-162-968-11	CERAMIC CHIP 0.0047MF	10%	50V
C543	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C544	1-162-968-11	CERAMIC CHIP 0.0047MF	10%	50V
C546	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C547	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C548	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C549	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C550	1-162-638-11	CERAMIC CHIP 1MF		16V
C551	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C552	1-164-227-11	CERAMIC CHIP 0.022MF	10%	25V
C553	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C554	1-164-227-11	CERAMIC CHIP 0.022MF	10%	25V
C555	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C556	1-162-638-11	CERAMIC CHIP 1MF		16V
C557	1-162-638-11	CERAMIC CHIP 1MF		16V
C558	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C559	1-162-921-11	CERAMIC CHIP 33PF	5%	50V
C560	1-162-921-11	CERAMIC CHIP 33PF	5%	50V
C561	1-162-638-11	CERAMIC CHIP 1MF		16V
C562	1-163-133-00	CERAMIC CHIP 470PF	5%	50V
C563	1-163-141-00	CERAMIC CHIP 0.001MF	5%	50V
C564	1-162-949-11	CERAMIC CHIP 47PF	5%	50V
C565	1-163-145-00	CERAMIC CHIP 0.0015MF	5%	50V
C566	1-162-945-11	CERAMIC CHIP 22PF	5%	50V
C567	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description		Remark
C571	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C572	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C573	1-162-915-11	CERAMIC CHIP 10PF	0.5PF	50V
C601	1-162-916-11	CERAMIC CHIP 12PF	5%	50V
C602	1-162-916-11	CERAMIC CHIP 12PF	5%	50V
C603	1-162-968-11	CERAMIC CHIP 0.0047MF	10%	50V
C604	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C606	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C607	1-124-443-00	ELECT 100MF	20%	10V
C608	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V
C609	1-162-638-11	CERAMIC CHIP 1MF		16V
C610	1-162-638-11	CERAMIC CHIP 1MF		16V
C611	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C612	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C613	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C614	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C615	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C616	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C618	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C622	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C623	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C661	1-162-966-11	CERAMIC CHIP 0.0022MF		50V
C662	1-163-023-00	CERAMIC CHIP 0.015MF		50V
C663	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C664	1-163-133-00	CERAMIC CHIP 470PF	5%	50V
C665	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C666	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C667	1-163-081-00	CERAMIC CHIP 0.22MF		25V
C668	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C681	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C682	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C683	1-162-962-11	CERAMIC CHIP 470PF	10%	50V
C690	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C691	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
		CONNECTOR		
CN101	1-566-531-11	CONNECTOR, FPC (ZIF) 15P		
CN201	1-566-542-31	CONNECTOR, FPC (NON ZIF) 10P		
CN202	1-568-342-41	CONNECTOR, BOARD TO BOARD 7P		
CN203	1-568-333-11	CONNECTOR, BOARD TO BOARD 14P		
CN204	1-568-364-41	CONNECTOR, BOARD TO BOARD 12P		
CN205	*1-565-876-11	PIN, CONNECTOR (PC BOARD) 4P		
CN206	*1-565-876-11	PIN, CONNECTOR (PC BOARD) 4P		
CN501	1-566-541-11	CONNECTOR, FPC (NON ZIF) 9P		
CN502	1-565-662-11	CONNECTOR (PC BOARD) 15P		
CN601	1-566-538-11	CONNECTOR, FPC (NON ZIF) 6P		
CN602	1-566-546-11	CONNECTOR, FPC (NON ZIF) 14P		
CN603	1-568-367-41	CONNECTOR, BOARD TO BOARD 18P		
CN604	1-568-334-11	CONNECTOR, BOARD TO BOARD 16P		
CN605	1-568-329-11	CONNECTOR, BOARD TO BOARD 17P		
CN607	1-565-527-11	PIN, CONNECTOR (PC BOARD) 2P		

Ref.No	Part No.	Description	Remark
		DIODE	
D201	8-719-404-46	DIODE MA110	
D202	8-719-404-46	DIODE MA110	
D211	8-719-118-21	DIODE 1SS283	
D213	8-719-404-35	DIODE MA141WK	
D214	8-719-404-35	DIODE MA141WK	
D215	8-719-800-76	DIODE 1SS226	
D216	8-719-404-46	DIODE MA110	
D217	8-719-404-46	DIODE MA110	
D218	8-719-404-46	DIODE MA110	
D501	8-719-938-75	DIODE SB05-05CP	
D502	8-719-938-75	DIODE SB05-05CP	
D503	8-719-938-75	DIODE SB05-05CP	
D601	8-719-404-40	DIODE MA121	
D602	8-719-404-40	DIODE MA121	
D603	8-719-404-40	DIODE MA121	
D604	8-719-404-40	DIODE MA121	
D605	8-719-404-46	DIODE MA110	
D606	8-719-404-46	DIODE MA110	
		FILTER	
FL201	1-236-186-21	FILTER, BAND PASS	
FL202	1-409-446-21	FILTER, TRAP	
FL203	1-577-162-11	FILTER, CERAMIC	
		IC	
IC101	8-752-033-38	IC CXA1202R	
IC102	8-752-033-38	IC CXA1202R	
IC201	8-752-033-40	IC CXA1201Q	
IC202	8-752-324-87	IC CXL1502M	
IC203	8-752-034-40	IC CXA1200BQ	
IC204	8-759-605-61	IC CXA1203N	
IC205	8-759-009-22	IC MC14094BF	
IC501	8-752-036-52	IC CXA1206N	
IC502	8-759-030-39	IC JSCQ3857SD02R	
IC503	8-759-107-68	IC CX20115A	
IC504	8-759-805-06	IC CXA1127M	
IC505	8-759-209-53	IC CXA1204Q	
IC601	8-752-808-84	IC CXP80116-163Q	
IC602	8-759-990-78	IC S-81350AG-REG	
IC603	8-759-987-66	IC TL7757	
IC604	8-759-100-95	IC UPC324G2	
IC605	8-759-030-64	IC MPC1710AM	
IC607	8-759-100-93	IC UPC393G2	
		COIL	
L101	1-412-033-11	INDUCTOR CHIP 220UH	
L102	1-410-385-11	INDUCTOR CHIP 22UH	
L103	1-412-033-11	INDUCTOR CHIP 220UH	
L104	1-410-385-11	INDUCTOR CHIP 22UH	
L161	1-412-029-11	INDUCTOR CHIP 10UH	
L162	1-412-029-11	INDUCTOR CHIP 10UH	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
L191	1-412-033-11	INDUCTOR CHIP 220UH	
L192	1-410-381-11	INDUCTOR CHIP 10UH	
L201	1-410-393-11	INDUCTOR CHIP 100UH	
L202	1-410-393-11	INDUCTOR CHIP 100UH	
L203	1-412-031-11	INDUCTOR CHIP 47UH	
L204	1-412-031-11	INDUCTOR CHIP 47UH	
L205	1-410-388-21	INDUCTOR CHIP 39UH	
L207	1-410-393-11	INDUCTOR CHIP 100UH	
L208	1-410-387-11	INDUCTOR CHIP 33UH	
L209	1-410-390-11	INDUCTOR CHIP 56UH	
L210	1-412-029-11	INDUCTOR CHIP 10UH	
L211	1-410-389-11	INDUCTOR CHIP 47UH	
L212	1-410-393-11	INDUCTOR CHIP 100UH	
L213	1-410-377-31	INDUCTOR CHIP 4.7UH	
L214	1-408-797-11	INDUCTOR CHIP 470UH	
L215	1-408-795-21	INDUCTOR CHIP 330UH	
L216	1-410-388-21	INDUCTOR CHIP 39UH	
L217	1-408-795-21	INDUCTOR CHIP 330UH	
L218	1-410-393-11	INDUCTOR CHIP 100UH	
L219	1-410-380-31	INDUCTOR CHIP 8.2UH	
L220	1-408-795-21	INDUCTOR CHIP 330UH	
L221	1-410-655-31	INDUCTOR CHIP 120UH	
L222	1-410-393-11	INDUCTOR CHIP 100UH	
L223	1-410-656-11	INDUCTOR CHIP 150UH	
L224	1-410-657-41	INDUCTOR CHIP 180UH	
L225	1-410-387-11	INDUCTOR CHIP 33UH	
L226	1-410-657-21	INDUCTOR CHIP 180UH	
L227	1-410-381-11	INDUCTOR CHIP 10UH	
L228	1-412-029-11	INDUCTOR CHIP 10UH	
L229	1-410-393-11	INDUCTOR CHIP 100UH	
L230	1-410-393-11	INDUCTOR CHIP 100UH	
L231	1-410-658-31	INDUCTOR CHIP 220UH	
L501	1-410-658-31	INDUCTOR CHIP 220UH	
L502	1-408-795-21	INDUCTOR CHIP 330UH	
L503	1-412-032-11	INDUCTOR CHIP 100UH	
L504	1-412-032-11	INDUCTOR CHIP 100UH	
L601	1-412-031-11	INDUCTOR CHIP 47UH	
L602	1-412-031-11	INDUCTOR CHIP 47UH	

IC LINK

Ref.No	Part No.	Description	Remark
PS601⚠.	1-532-605-00	LINK, IC ICP-N10 (0.4A)	
PS602⚠.	1-532-685-00	LINK, IC ICP-N20 (0.8A)	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q101	8-729-209-07	TRANSISTOR 2SC4213-B	
Q102	8-729-209-07	TRANSISTOR 2SC4213-B	
Q103	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q104	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q105	8-729-209-07	TRANSISTOR 2SC4213-B	
Q106	8-729-209-07	TRANSISTOR 2SC4213-B	
Q107	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q108	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q161	8-729-403-35	TRANSISTOR UN5113	
Q162	8-729-117-32	TRANSISTOR 2SC4177-L6	
Q164	8-729-402-42	TRANSISTOR UN5213	
Q165	8-729-402-42	TRANSISTOR UN5213	
Q166	8-729-402-42	TRANSISTOR UN5213	
Q167	8-729-402-42	TRANSISTOR UN5213	
Q191	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q193	8-729-216-22	TRANSISTOR 2SA1162-G	
Q201	8-729-104-26	TRANSISTOR 2SB804-AW	
Q202	8-729-602-36	TRANSISTOR 2SA1602-F	
Q203	8-729-602-36	TRANSISTOR 2SA1602-F	
Q204	8-729-402-42	TRANSISTOR UN5213	
Q205	8-729-602-36	TRANSISTOR 2SA1602-F	
Q206	8-729-907-00	TRANSISTOR DTC114EU	
Q207	8-729-140-88	TRANSISTOR FPIA3M	
Q208	8-729-102-08	TRANSISTOR 2SC2223-F14	
Q209	8-729-402-42	TRANSISTOR UN5213	
Q212	8-729-602-36	TRANSISTOR 2SA1602-F	
Q213	8-729-117-32	TRANSISTOR 2SC4177-L6	
Q214	8-729-117-32	TRANSISTOR 2SC4177-L6	
Q215	8-729-905-23	TRANSISTOR 2SA1576-R	
Q216	8-729-905-23	TRANSISTOR 2SA1576-R	
Q217	8-729-102-08	TRANSISTOR 2SC2223-F14	
Q218	8-729-117-32	TRANSISTOR 2SC4177-L6	
Q219	8-729-602-36	TRANSISTOR 2SA1602-F	
Q220	8-729-117-32	TRANSISTOR 2SC4177-L6	
Q221	8-729-403-35	TRANSISTOR UN5113	
Q222	8-729-117-32	TRANSISTOR 2SC4177-L6	
Q223	8-729-602-36	TRANSISTOR 2SA1602-F	
Q224	8-729-403-35	TRANSISTOR UN5113	
Q225	8-729-117-32	TRANSISTOR 2SC4177-L6	
Q226	8-729-807-87	TRANSISTOR 2SB1295-UL6	
Q227	8-729-602-36	TRANSISTOR 2SA1602-F	
Q228	8-729-117-32	TRANSISTOR 2SC4177-L6	
Q229	8-729-905-15	TRANSISTOR DTC144WU	
Q230	8-729-117-32	TRANSISTOR 2SC4177-L6	
Q231	8-729-905-15	TRANSISTOR DTC144WU	
Q232	8-729-140-88	TRANSISTOR FPIA3M	
Q233	8-729-117-32	TRANSISTOR 2SC4177-L6	
Q234	8-729-117-32	TRANSISTOR 2SC4177-L6	
Q235	8-729-602-36	TRANSISTOR 2SA1602-F	
Q236	8-729-602-36	TRANSISTOR 2SA1602-F	
Q237	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q238	8-729-102-08	TRANSISTOR 2SC2223-F14	
Q239	8-729-117-32	TRANSISTOR 2SC4177-L6	
Q241	8-729-602-36	TRANSISTOR 2SA1602-F	
Q242	8-729-402-42	TRANSISTOR UN5213	
Q243	8-729-403-35	TRANSISTOR UN5113	
Q244	8-729-420-12	TRANSISTOR XN4213	
Q245	8-729-102-08	TRANSISTOR 2SC2223-F14	
Q246	8-729-117-32	TRANSISTOR 2SC4177-L6	
Q247	8-729-117-32	TRANSISTOR 2SC4177-L6	
Q248	8-729-403-35	TRANSISTOR UN5113	
Q249	8-729-420-12	TRANSISTOR XN4213	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

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Ref.No	Part No.	Description	Remark
Q250	8-729-403-35	TRANSISTOR UN5113	
Q251	8-729-402-42	TRANSISTOR UN5213	
Q252	8-729-117-32	TRANSISTOR 2SC4177-L6	
Q253	8-729-117-32	TRANSISTOR 2SC4177-L6	
Q254	8-729-403-35	TRANSISTOR UN5113	
Q255	8-729-921-08	TRANSISTOR DTC144TU	
Q256	8-729-402-42	TRANSISTOR UN5213	
Q258	8-729-921-08	TRANSISTOR DTC144TU	
Q259	8-729-921-08	TRANSISTOR DTA144TU	
Q260	8-729-117-32	TRANSISTOR 2SC4177-L6	
Q261	8-729-602-36	TRANSISTOR 2SA1602-F	
Q270	8-729-602-36	TRANSISTOR 2SA1602-F	
Q271	8-729-117-32	TRANSISTOR 2SC4177-L6	
Q272	8-729-602-36	TRANSISTOR 2SA1602-F	
Q501	8-729-920-39	TRANSISTOR IMT1US	
Q541	8-729-602-36	TRANSISTOR 2SA1602-F	
Q542	8-729-117-32	TRANSISTOR 2SC4177-L6	
Q543	8-729-602-36	TRANSISTOR 2SA1602-F	
Q571	8-729-920-39	TRANSISTOR IMT1US	
Q572	8-729-920-39	TRANSISTOR IMT1US	
Q573	8-729-117-32	TRANSISTOR 2SC4177-L6	
Q574	8-729-903-82	TRANSISTOR FMW2	
Q575	8-729-904-04	TRANSISTOR FMS2	
Q576	8-729-117-32	TRANSISTOR 2SC4177-L6	
Q577	8-729-807-16	TRANSISTOR 2SD1621	
Q578	8-729-903-97	TRANSISTOR FMS1FE	
Q579	8-729-602-36	TRANSISTOR 2SA1602	
Q601	8-729-403-24	TRANSISTOR XN4210	
Q602	8-729-403-24	TRANSISTOR XN4210	
Q603	8-729-403-24	TRANSISTOR XN4210	
Q604	8-729-403-24	TRANSISTOR XN4210	
Q606	8-729-403-24	TRANSISTOR XN4210	
Q607	8-729-403-24	TRANSISTOR XN4210	
Q608	8-729-403-24	TRANSISTOR XN4210	
Q609	8-729-403-24	TRANSISTOR XN4210	
Q610	8-729-403-24	TRANSISTOR XN4210	
Q611	8-729-420-12	TRANSISTOR XN4213	
Q612	8-729-403-35	TRANSISTOR UN5113	
Q613	8-729-402-42	TRANSISTOR UN5213	
Q614	8-729-903-97	TRANSISTOR FMS1FE	
Q615	8-729-903-82	TRANSISTOR FMW2	
Q616	8-729-117-32	TRANSISTOR 2SC4177-L6	
Q617	8-729-903-97	TRANSISTOR FMS1FE	
Q618	8-729-903-97	TRANSISTOR FMS1FE	
Q619	8-729-907-00	TRANSISTOR DTC114EU	
Q620	8-729-421-90	TRANSISTOR XN4113	
Q621	8-729-420-12	TRANSISTOR XN4213	
Q622	8-729-422-14	TRANSISTOR XN4111	
Q623	8-729-117-32	TRANSISTOR 2SC4177-L6	
Q624	8-729-422-14	TRANSISTOR XN4111	
Q643	8-729-403-24	TRANSISTOR XN4210	
Q644	8-729-403-35	TRANSISTOR UN5113	
Q645	8-729-402-42	TRANSISTOR UN5213	

Ref.No	Part No.	Description	Remark
Q661	8-729-117-32	TRANSISTOR 2SC4177-L6	
Q662	8-729-602-36	TRANSISTOR 2SA1602-F	
Q663	8-729-117-32	TRANSISTOR 2SC4177-L6	
Q664	8-729-602-36	TRANSISTOR 2SA1602-F	
Q665	8-729-117-32	TRANSISTOR 2SC4177-L6	
Q681	8-729-117-32	TRANSISTOR 2SC4177-L6	
Q682	8-729-820-46	TRANSISTOR 2SB1202FAS	
Q683	8-729-902-93	TRANSISTOR FMG4	
Q684	8-729-903-97	TRANSISTOR FMS1FE	

RESISTOR

Ref.No	Part No.	Description				Remark
R101	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R102	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R103	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R104	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R105	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R106	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R107	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R108	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R109	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R110	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R111	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R112	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R113	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R114	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R115	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R116	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R117	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R118	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R119	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R120	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R121	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R122	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R123	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R124	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R125	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R126	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R127	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R128	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R129	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R130	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R131	1-216-851-11	METAL GLAZE	330K	5%	1/16W	
R132	1-216-851-11	METAL GLAZE	330K	5%	1/16W	
R134	1-216-851-11	METAL GLAZE	330K	5%	1/16W	
R135	1-216-851-11	METAL GLAZE	330K	5%	1/16W	
R139	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R140	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R141	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R142	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R143	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R144	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R161	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R162	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R163	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R164	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R165	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R166	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R167	1-216-843-11	METAL GLAZE	68K	5%	1/16W	
R168	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R170	1-216-847-11	METAL GLAZE	150K	5%	1/16W	
R171	1-216-847-11	METAL GLAZE	150K	5%	1/16W	
R172	1-216-847-11	METAL GLAZE	150K	5%	1/16W	
R173	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R174	1-216-815-11	METAL GLAZE	330	5%	1/16W	
R175	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R176	1-216-791-11	METAL GLAZE	3.3	5%	1/16W	
R177	1-216-791-11	METAL GLAZE	3.3	5%	1/16W	
R191	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R192	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R193	1-216-815-11	METAL GLAZE	330	5%	1/16W	
R194	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R197	1-216-801-11	METAL GLAZE	22	5%	1/16W	
R198	1-216-818-11	METAL GLAZE	560	5%	1/16W	
R201	1-216-804-11	METAL GLAZE	39	5%	1/16W	
R202	1-216-804-11	METAL GLAZE	39	5%	1/16W	
R203	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R204	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R205	1-216-791-11	METAL GLAZE	3.3	5%	1/16W	
R206	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R207	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R208	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R209	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R210	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R211	1-216-022-00	METAL GLAZE	75	5%	1/10W	
R214	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R215	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R216	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R217	1-216-699-11	METAL CHIP	100K	0.50%	1/10W	
R218	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R219	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R220	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R221	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R222	1-216-814-11	METAL GLAZE	270	5%	1/16W	
R223	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R224	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R225	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R226	1-216-815-11	METAL GLAZE	330	5%	1/16W	
R227	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R228	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R229	1-216-810-11	METAL GLAZE	120	5%	1/16W	
R230	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R231	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R232	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R233	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R234	1-216-811-11	METAL GLAZE	150	5%	1/16W	
R235	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R236	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R237	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R238	1-216-814-11	METAL GLAZE	270	5%	1/16W	
R239	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R240	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R241	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R243	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R244	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R245	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R246	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R247	1-216-807-11	METAL GLAZE	68	5%	1/16W	
R249	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R250	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R251	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R252	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R253	1-216-819-11	METAL GLAZE	680	5%	1/16W	
R254	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R255	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R256	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R257	1-216-853-11	METAL GLAZE	470K	5%	1/16W	
R258	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R259	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R260	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R261	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R262	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R263	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R264	1-216-813-11	METAL GLAZE	220	5%	1/16W	
R265	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R266	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R267	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W	
R268	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R269	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R270	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R271	1-216-818-11	METAL GLAZE	560	5%	1/16W	
R272	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R273	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R274	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R275	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R276	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R277	1-216-810-11	METAL GLAZE	120	5%	1/16W	
R278	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R279	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R280	1-216-819-11	METAL GLAZE	680	5%	1/16W	
R281	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R282	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W	
R283	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R284	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R285	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R286	1-216-663-11	METAL CHIP	3.3K	0.50%	1/10W	
R287	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R288	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R289	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R290	1-216-843-11	METAL GLAZE	68K	5%	1/16W	

When indicating parts by reference number, please include the board name.

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Ref.No	Part No.	Description				Remark
R291	1-216-855-11	METAL GLAZE	680K	5%	1/16W	
R293	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R294	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R295	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R296	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R297	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R298	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R300	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R301	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R302	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R303	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R304	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R305	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R306	1-216-813-11	METAL GLAZE	220	5%	1/16W	
R311	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R315	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R316	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R317	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R318	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R319	1-216-818-11	METAL GLAZE	560	5%	1/16W	
R320	1-216-815-11	METAL GLAZE	330	5%	1/16W	
R321	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R322	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R325	1-216-819-11	METAL GLAZE	680	5%	1/16W	
R326	1-216-813-11	METAL GLAZE	220	5%	1/16W	
R327	1-216-819-11	METAL GLAZE	680	5%	1/16W	
R328	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R329	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R330	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R331	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R332	1-216-818-11	METAL GLAZE	560	5%	1/16W	
R333	1-216-809-11	METAL GLAZE	100	5%	1/16W	
R334	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R335	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W	
R336	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R337	1-216-818-11	METAL GLAZE	560	5%	1/16W	
R338	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R339	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R341	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R342	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R343	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R344	1-216-818-11	METAL GLAZE	560	5%	1/16W	
R345	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R346	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R347	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R348	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R349	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R352	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R354	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R355	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R356	1-216-808-11	METAL GLAZE	82	5%	1/16W	
R357	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R358	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R359	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R360	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R361	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R362	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R363	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R364	1-216-805-11	METAL GLAZE	47	5%	1/16W	
R365	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R369	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R377	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R378	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R379	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R380	1-216-699-11	METAL CHIP	100K	0.50%	1/10W	
R381	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R382	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R390	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R391	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R392	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R393	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R394	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R396	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R501	1-216-336-11	METAL GLAZE	47K	1%	1/10W	
R502	1-216-336-11	METAL GLAZE	47K	1%	1/10W	
R503	1-216-101-00	METAL GLAZE	150K	1%	1/10W	
R504	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R505	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R506	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R507	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R508	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R509	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R510	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R511	1-216-834-11	METAL GLAZE	12K	5%	1/16W	
R512	1-217-671-11	METAL GLAZE	1	5%	1/10W	
R513	1-217-671-11	METAL GLAZE	1	5%	1/10W	
R514	1-217-671-11	METAL GLAZE	1	5%	1/10W	
R515	1-217-671-11	METAL GLAZE	1	5%	1/10W	
R519	1-216-849-11	METAL GLAZE	220K	5%	1/16W	
R520	1-216-805-11	METAL GLAZE	47	5%	1/16W	
R521	1-216-846-11	METAL GLAZE	120K	5%	1/16W	
R522	1-216-847-11	METAL GLAZE	150K	5%	1/16W	
R523	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R524	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R525	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R526	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R527	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R528	1-216-789-11	METAL GLAZE	2.2	5%	1/16W	
R529	1-216-789-11	METAL GLAZE	2.2	5%	1/16W	
R530	1-216-789-11	METAL GLAZE	2.2	5%	1/16W	
R531	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R532	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R533	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R534	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R535	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R543	1-216-821-11	METAL GLAZE	1K	5%	1/16W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R544	1-216-814-11	METAL GLAZE	270	5%	1/16W	
R545	1-216-812-11	METAL GLAZE	180	5%	1/16W	
R548	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R549	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R550	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R551	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R552	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R553	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R554	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R555	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R556	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R557	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R558	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R559	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R560	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R571	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R572	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R573	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R574	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R575	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R576	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R577	1-216-819-11	METAL GLAZE	680	5%	1/16W	
R578	1-216-843-11	METAL GLAZE	68K	5%	1/16W	
R579	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R580	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R581	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R582	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R583	1-216-809-11	METAL GLAZE	100	5%	1/16W	
R584	1-216-017-00	METAL GLAZE	47	5%	1/10W	
R585	1-216-174-00	METAL GLAZE	100	5%	1/8W	
R586	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R587	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R588	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R589	1-216-689-11	METAL CHIP	39K	0.50%	1/10W	
R590	1-216-655-11	METAL CHIP	1.5K	0.50%	1/10W	
R591	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R592	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R601	1-216-864-11	METAL GLAZE	0	5%	1/16W	(E, Australian)
R604	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R605	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R610	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R611	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R612	1-216-852-11	METAL GLAZE	390K	5%	1/16W	
R613	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R614	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R615	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R616	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R617	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R618	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R619	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R620	1-216-844-11	METAL GLAZE	82K	5%	1/16W	
R621	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	

Ref.No	Part No.	Description				Remark
R622	1-216-844-11	METAL GLAZE	82K	5%	1/16W	
R625	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R626	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R627	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R633	1-216-176-00	METAL GLAZE	120	5%	1/8W	
R634	1-216-174-00	METAL GLAZE	100	5%	1/8W	
R635	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R645	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R646	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R647	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R648	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R661	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R662	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R663	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R664	1-216-809-11	METAL GLAZE	100	5%	1/16W	
R665	1-216-810-11	METAL GLAZE	120	5%	1/16W	
R666	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R667	1-216-843-11	METAL GLAZE	68K	5%	1/16W	
R668	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R669	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R670	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R671	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R672	1-216-854-11	METAL GLAZE	560K	5%	1/16W	
R673	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R674	1-216-851-11	METAL GLAZE	330K	5%	1/16W	
R675	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R676	1-216-861-11	METAL GLAZE	2.2M	5%	1/16W	
R678	1-216-847-11	METAL GLAZE	150K	5%	1/16W	
R679	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R681	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R682	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R683	1-216-194-00	METAL GLAZE	680	5%	1/8W	
R684	1-216-194-00	METAL GLAZE	680	5%	1/8W	
R685	1-216-194-00	METAL GLAZE	680	5%	1/8W	
R686	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R688	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R689	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R690	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R691	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R695	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R696	1-217-671-11	METAL GLAZE	1	5%	1/10W	
R697	1-217-671-11	METAL GLAZE	1	5%	1/10W	

NETWORK RESISTOR

RB101	1-236-420-11	NETWORK, RES 4.7K
RB102	1-236-420-11	NETWORK, RES 4.7K
RB107	1-236-420-11	NETWORK, RES 4.7K
RB108	1-236-420-11	NETWORK, RES 4.7K
RB201	1-236-424-11	NETWORK, RES 10K
RB204	1-236-408-11	NETWORK, RES 470
RB206	1-236-409-11	NETWORK, RES 560
RB207	1-236-436-11	NETWORK, RES 100K
RB208	1-236-412-11	NETWORK, RES 1.0K

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
RB209	1-236-420-11	NETWORK, RES 4.7K	
RB501	1-236-432-11	NETWORK, RES 47K	
RB502	1-236-424-11	NETWORK, RES 10K	
RB541	1-236-408-11	NETWORK, RES 470	
RB542	1-236-418-11	NETWORK, RES 3.3K	
RB543	1-236-418-11	NETWORK, RES 3.3K	
RB601	1-236-436-11	NETWORK, RES 100K	
RB602	1-236-436-11	NETWORK, RES 100K	
RB603	1-236-436-11	NETWORK, RES 100K	
RB604	1-236-436-11	NETWORK, RES 100K	
RB605	1-236-436-11	NETWORK, RES 100K	
RB606	1-236-436-11	NETWORK, RES 100K	
RB607	1-236-436-11	NETWORK, RES 100K	
RB608	1-236-436-11	NETWORK, RES 100K	
RB609	1-236-436-11	NETWORK, RES 100K	
RB610	1-236-424-11	NETWORK, RES 10K	
RB611	1-236-424-11	NETWORK, RES 10K	
RB612	1-236-424-11	NETWORK, RES 10K	
RB613	1-236-424-11	NETWORK, RES 10K	
RB614	1-236-424-11	NETWORK, RES 10K	
RB615	1-236-436-11	NETWORK, RES 100K	
RB616	1-236-424-11	NETWORK, RES 10K	
RB617	1-236-431-11	NETWORK, RES 39K	
RB618	1-236-432-11	NETWORK, RES 47K	
RB619	1-236-424-11	NETWORK, RES 10K	
RB620	1-236-408-11	NETWORK, RES 470	
RB621	1-236-408-11	NETWORK, RES 470	
RB661	1-236-424-11	NETWORK, RES 10K	
RB662	1-236-442-11	NETWORK, RES 330K	
RB681	1-236-424-11	NETWORK, RES 10K	
RB682	1-236-424-11	NETWORK, RES 10K	

VARIABLE RESISTOR

Ref.No	Part No.	Description	Remark
RV101	1-238-089-11	RES, ADJ CERMET 4.7K	
RV102	1-238-089-11	RES, ADJ CERMET 4.7K	
RV103	1-238-089-11	RES, ADJ CERMET 4.7K	
RV104	1-238-089-11	RES, ADJ CERMET 4.7K	
RV111	1-238-092-11	RES, ADJ CERMET 47K	
RV112	1-238-092-11	RES, ADJ CERMET 47K	
RV113	1-238-092-11	RES, ADJ CERMET 47K	
RV114	1-238-092-11	RES, ADJ CERMET 47K	
RV201	1-238-092-11	RES, ADJ CERMET 47K	
RV202	1-238-087-11	RES, ADJ CERMET 1K	
RV203	1-238-088-11	RES, ADJ, CERMET 2.2K	
RV204	1-238-089-11	RES, ADJ CERMET 4.7K	
RV205	1-238-088-11	RES, ADJ, CERMET 2.2K	
RV206	1-238-092-11	RES, ADJ CERMET 47K	
RV207	1-238-090-11	RES, ADJ CERMET 10K	
RV208	1-238-086-11	RES, ADJ CERMET 470	
RV209	1-238-087-11	RES, ADJ CERMET 1K	
RV210	1-238-086-11	RES, ADJ CERMET 470	
RV212	1-238-089-11	RES, ADJ CERMET 4.7K	
RV213	1-238-090-11	RES, ADJ CERMET 10K	
RV501	1-238-090-11	RES, ADJ CERMET 10K	
RV502	1-238-095-11	RES, ADJ CERMET 470K	
RV602	1-238-092-11	RES, ADJ CERMET 47K	

FLEXIBLE BOARD

Ref.No	Part No.	Description	Remark
W604	1-630-592-11	FP-184 FLEXIBLE BOARD	

CRYSTAL

Ref.No	Part No.	Description	Remark
X201	1-577-117-21	VIBRATOR, CRYSTAL (4.43MHz)	
X501	1-577-362-21	VIBRATOR, CRYSTAL (5.85938MHz)	
X601	1-577-349-21	VIBRATOR, CRYSTAL (16MHz)	

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*A-7061-848-A AU-51 BOARD, COMPLETE (Ref.No 3,000 Series)
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CAPACITOR

Ref.No	Part No.	Description				Remark
C421	1-126-206-11	ELECT CHIP	100MF	20%	6.3V	
C422	1-164-247-11	CERAMIC CHIP	0.047MF	10%	16V	
C423	1-135-147-21	TANTAL. CHIP	1MF	20%	20V	
C424	1-135-147-21	TANTAL. CHIP	1MF	20%	20V	
C425	1-162-969-11	CERAMIC CHIP	0.0068MF	10%	25V	
C426	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V	
C428	1-135-150-21	TANTAL. CHIP	3.3MF	20%	6.3V	
C429	1-126-205-11	ELECT CHIP	47MF	20%	6.3V	
C430	1-164-156-11	CERAMIC CHIP	0.1MF		25V	
C431	1-126-199-11	ELECT CHIP	6.8MF	20%	35V	
C432	1-126-205-11	ELECT CHIP	47MF	20%	6.3V	
C433	1-126-206-11	ELECT CHIP	100MF	20%	6.3V	
C434	1-135-147-21	TANTAL. CHIP	1MF	20%	20V	
C435	1-126-206-11	ELECT CHIP	100MF	20%	6.3V	
C436	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V	
C437	1-164-247-11	CERAMIC CHIP	0.047MF	10%	16V	
C438	1-164-156-11	CERAMIC CHIP	0.1MF		25V	
C439	1-135-149-21	TANTAL. CHIP	2.2MF	20%	10V	
C440	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V	
C441	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V	
C442	1-164-227-11	CERAMIC CHIP	0.022MF	10%	25V	
C443	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C444	1-135-145-11	TANTAL. CHIP	0.47MF	20%	35V	
C445	1-162-965-11	CERAMIC CHIP	0.0015MF	10%	50V	
C446	1-163-016-00	CERAMIC CHIP	0.0039MF	10%	50V	
C447	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C448	1-162-966-11	CERAMIC CHIP	0.0022MF	10%	50V	
C449	1-162-970-11	CERAMIC CHIP	0.01MF	10%	25V	
C450	1-162-910-11	CERAMIC CHIP	5PF	0.25PF	50V	
C451	1-163-133-00	CERAMIC CHIP	470PF	5%	50V	
C452	1-162-910-11	CERAMIC CHIP	5PF	0.25PF	50V	
C453	1-162-968-11	CERAMIC CHIP	0.0047MF	10%	50V	
C454	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C455	1-162-587-11	CERAMIC CHIP	0.039MF	10%	25V	
C456	1-162-963-11	CERAMIC CHIP	680PF	10%	50V	
C457	1-163-020-00	CERAMIC CHIP	0.0082MF	10%	50V	
C458	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description			Remark
C459	1-135-147-21	TANTAL. CHIP 1MF	20%	20V	
C460	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V	
C461	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V	
C462	1-135-149-21	TANTAL. CHIP 2.2MF	20%	10V	
C463	1-126-205-11	ELECT CHIP 47MF	20%	6.3V	
C464	1-126-205-11	ELECT CHIP 47MF	20%	6.3V	
C465	1-162-955-11	CERAMIC CHIP 150PF	5%	50V	
C466	1-162-966-11	CERAMIC CHIP 0.0022MF	10%	50V	
C467	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V	
C469	1-162-957-11	CERAMIC CHIP 220PF	5%	50V	
C470	1-162-953-11	CERAMIC CHIP 100PF	5%	50V	
C471	1-162-953-11	CERAMIC CHIP 100PF	5%	50V	

CONNECTOR

Ref.No	Part No.	Description
CN401	1-568-365-41	CONNECTOR, BOARD TO BOARD 14P
CN402	*1-566-758-11	PIN, CONNECTOR (PC BOARD) 3P
CN403	1-566-757-11	PIN, CONNECTOR (PC BOARD) 2P

DIODE

Ref.No	Part No.	Description
D402	8-719-420-15	DIODE MA8082-M

FILTER

Ref.No	Part No.	Description
FL401	1-236-145-11	FILTER, BAND PASS

IC

Ref.No	Part No.	Description
IC401	8-752-033-01	IC CXA1237AR

COIL

Ref.No	Part No.	Description
L401	1-412-032-11	INDUCTOR CHIP 100UH
L402	1-410-658-31	INDUCTOR CHIP 220UH

TRANSISTOR

Ref.No	Part No.	Description
Q406	8-729-905-35	TRANSISTOR 2SC4081-R
Q409	8-729-905-35	TRANSISTOR 2SC4081-R
Q410	8-729-905-35	TRANSISTOR 2SC4081-R
Q411	8-729-905-15	TRANSISTOR DTC144WU
Q412	8-729-905-09	TRANSISTOR DTA144WU
Q413	8-729-905-35	TRANSISTOR 2SC4081-R
Q414	8-729-905-09	TRANSISTOR DTA144WU
Q415	8-729-821-88	TRANSISTOR 2SK1332-3
Q416	8-729-905-35	TRANSISTOR 2SC4081-R
Q417	8-729-905-23	TRANSISTOR 2SA1576-R
Q418	8-729-905-23	TRANSISTOR 2SA1576-R
Q419	8-729-905-35	TRANSISTOR 2SC4081-R

RESISTOR

Ref.No	Part No.	Description			Remark
R421	1-216-841-11	METAL GLAZE	47K	5%	1/16W
R422	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W
R423	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R424	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R425	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R426	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R430	1-216-849-11	METAL GLAZE	220K	5%	1/16W
R431	1-216-853-11	METAL GLAZE	470K	5%	1/16W
R432	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W
R433	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W
R434	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R435	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R436	1-216-838-11	METAL GLAZE	27K	5%	1/16W
R437	1-216-835-11	METAL GLAZE	15K	5%	1/16W
R438	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R439	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W
R440	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R441	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W
R442	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R443	1-216-801-11	METAL GLAZE	22	5%	1/16W
R444	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W
R445	1-216-851-11	METAL GLAZE	330K	5%	1/16W
R446	1-216-843-11	METAL GLAZE	68K	5%	1/16W
R447	1-216-841-11	METAL GLAZE	47K	5%	1/16W
R448	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R449	1-216-837-11	METAL GLAZE	22K	5%	1/16W
R450	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R451	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R452	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R453	1-216-649-11	METAL CHIP	820	0.50%	1/10W
R454	1-216-649-11	METAL CHIP	820	0.50%	1/10W
R455	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W
R456	1-216-834-11	METAL GLAZE	12K	5%	1/16W
R457	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W
R458	1-216-819-11	METAL GLAZE	680	5%	1/16W
R459	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W
R460	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W
R461	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W
R462	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W
R463	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R464	1-216-836-11	METAL GLAZE	18K	5%	1/16W
R465	1-216-836-11	METAL GLAZE	18K	5%	1/16W
R466	1-216-835-11	METAL GLAZE	15K	5%	1/16W
R467	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W
R468	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R469	1-216-820-11	METAL GLAZE	820	5%	1/16W
R470	1-216-814-11	METAL GLAZE	270	5%	1/16W
R471	1-216-810-11	METAL GLAZE	120	5%	1/16W
R472	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W
R473	1-216-045-00	METAL GLAZE	680	5%	1/10W
R474	1-216-041-00	METAL GLAZE	470	5%	1/10W
R475	1-216-817-11	METAL GLAZE	470	5%	1/16W

VARIABLE RESISTOR

Ref.No	Part No.	Description
RV401	1-238-090-11	RES, ADJ CERMET 10K
RV402	1-238-091-11	RES, ADJ CERMET 22K

When indicating parts by reference number, please include the board name.

LD-11

Ref.No	Part No.	Description	Remark
	*A-7061-849-A	LD-11 BOARD, COMPLETE (Ref.No 3,000 Series) **********************	
		CAPACITOR	
C701	1-135-155-21	TANTAL. CHIP 4.7MF 20% 16V	
C702	1-162-974-11	CERAMIC CHIP 0.01MF 50V	
C703	1-164-227-11	CERAMIC CHIP 0.022MF 10% 25V	
C704	1-135-157-21	TANTAL. CHIP 10MF 20% 6.3V	
C705	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C707	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C708	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C709	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C710	1-135-155-21	TANTAL. CHIP 4.7MF 20% 16V	
C711	1-162-974-11	CERAMIC CHIP 0.01MF 50V	
C712	1-162-638-11	CERAMIC CHIP 1MF 16V	
C713	1-162-964-11	CERAMIC CHIP 0.001MF 10% 50V	
C714	1-162-637-11	CERAMIC CHIP 0.47MF 16V	
C715	1-164-156-11	CERAMIC CHIP 0.1MF 25V	
C716	1-164-156-11	CERAMIC CHIP 0.1MF 25V	
C717	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C718	1-162-966-11	CERAMIC CHIP 0.0022MF 10% 50V	
C719	1-162-966-11	CERAMIC CHIP 0.0022MF 10% 50V	
C720	1-164-156-11	CERAMIC CHIP 0.1MF 25V	
C721	1-162-968-11	CERAMIC CHIP 0.0047MF 10% 50V	
		CONNECTOR	
CN701	1-568-336-11	CONNECTOR, BOARD TO BOARD 20P	
CN702	1-566-540-11	CONNECTOR, FPC (NON ZIF) 8P	
CN703	*1-565-543-11	PIN, CONNECTOR (PC BOARD) 4P	
CN704	*1-565-542-21	PIN, CONNECTOR (PC BOARD) 3P	
CN705	*1-565-542-11	PIN, CONNECTOR (PC BOARD) 3P	
		DIODE	
D701	8-719-404-46	DIODE MA110	
		IC	
IC701	8-759-231-23	IC TK10500M	
IC702	8-759-100-94	IC UPC358G2	
IC703	8-759-030-35	IC MPC1725M	
IC704	8-759-981-82	IC RC3414M	
		IC LINK	
PS701⚠	1-532-605-00	LINK, IC ICP-N10 (0.4A)	
		TRANSISTOR	
Q701	8-729-402-78	TRANSISTOR XN6401	
Q702	8-729-907-00	TRANSISTOR DTC114EU	
Q703	8-729-402-42	TRANSISTOR UN5213	
Q704	8-729-402-78	TRANSISTOR XN6401	
Q705	8-729-805-25	TRANSISTOR 2SB1121	
Q706	8-729-905-35	TRANSISTOR 2SC4081-R	
Q707	8-729-905-15	TRANSISTOR DTC144WU	
Q708	8-729-402-84	TRANSISTOR XN4601	

Ref.No	Part No.	Description	Remark
Q709	8-729-402-84	TRANSISTOR XN4601	
		RESISTOR	
R701	1-216-298-00	METAL GLAZE 2.2 5% 1/10W	
R702	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R703	1-216-828-11	METAL GLAZE 3.9K 5% 1/16W	
R704	1-216-839-11	METAL GLAZE 33K 5% 1/16W	
R705	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R706	1-216-835-11	METAL GLAZE 15K 5% 1/16W	
R707	1-216-835-11	METAL GLAZE 15K 5% 1/16W	
R708	1-216-828-11	METAL GLAZE 3.9K 5% 1/16W	
R709	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R710	1-216-298-00	METAL GLAZE 2.2 5% 1/10W	
R711	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R712	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R713	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R714	1-216-843-11	METAL GLAZE 68K 5% 1/16W	
R715	1-216-837-11	METAL GLAZE 22K 5% 1/16W	
R717	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R718	1-216-821-11	METAL GLAZE 1K 5% 1/16W	
R719	1-216-309-00	METAL GLAZE 5.6 5% 1/10W	
R720	1-216-837-11	METAL GLAZE 22K 5% 1/16W	
R721	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R722	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R723	1-216-842-11	METAL GLAZE 56K 5% 1/16W	
R724	1-216-809-11	METAL GLAZE 100 5% 1/16W	
R725	1-216-857-11	METAL GLAZE 1M 5% 1/16W	
R726	1-216-857-11	METAL GLAZE 1M 5% 1/16W	
R730	1-216-833-11	METAL GLAZE 10K 5% 1/16W	
R731	1-216-823-11	METAL GLAZE 1.5K 5% 1/16W	
R732	1-216-837-11	METAL GLAZE 22K 5% 1/16W	
R733	1-216-826-11	METAL GLAZE 2.7K 5% 1/16W	
R734	1-216-840-11	METAL GLAZE 39K 5% 1/16W	
R739	1-216-840-11	METAL GLAZE 39K 5% 1/16W	
R740	1-216-839-11	METAL GLAZE 33K 5% 1/16W	
R741	1-216-830-11	METAL GLAZE 5.6K 5% 1/16W	
R742	1-216-830-11	METAL GLAZE 5.6K 5% 1/16W	
R743	1-216-296-00	METAL GLAZE 0 5% 1/8W	
		NETWORK RESISTOR	
RB701	1-236-424-11	NETWORK, RES 10K	
		VARIABLE RESISTOR	
RV701	1-238-094-11	RES, ADJ CERMET 220K	
		FLEXIBLE BOARD	
W701	1-630-595-11	FP-187 FLEXIBLE BOARD	

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The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

*A-7061-850-A TI-15 BOARD, COMPLETE (Ref.No 4,000 Series)
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CAPACITOR

Ref.No	Part No.	Description		Remark
C801	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C802	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C803	1-162-637-11	CERAMIC CHIP 0.47MF		16V
C804	1-162-913-11	CERAMIC CHIP 8PF	0.5PF	50V
C805	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C807	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C808	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C810	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C811	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C812	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C813	1-162-949-11	CERAMIC CHIP 47PF	5%	50V
C814	1-162-949-11	CERAMIC CHIP 47PF	5%	50V
C815	1-162-949-11	CERAMIC CHIP 47PF	5%	50V
C816	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C817	1-162-921-11	CERAMIC CHIP 33PF	5%	50V
C818	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C819	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V

CONNECTOR

Ref.No	Part No.	Description
CN801	1-568-368-41	CONNECTOR, BOARD TO BOARD 20P

TRIMMER

Ref.No	Part No.	Description
CT801	1-141-368-11	CAP, CHIP TRIMMER (30P)
CT802	1-141-368-11	CAP, CHIP TRIMMER (30P)

DIODE

Ref.No	Part No.	Description
D801	8-713-300-88	DIODE 1T33C-01

IC

Ref.No	Part No.	Description
IC801	8-759-947-01	IC MB8464A-15LLPF
IC802	8-759-140-26	IC UPD6145G-601
IC803	8-759-983-54	IC MB87485

COIL

Ref.No	Part No.	Description
L801	1-410-377-31	INDUCTOR CHIP 4.7UH
L802	1-410-384-11	INDUCTOR CHIP 18UH
L803	1-410-390-11	INDUCTOR CHIP 56UH
L804	1-410-381-11	INDUCTOR CHIP 10UH

TRANSISTOR

Ref.No	Part No.	Description
Q801	8-729-905-18	TRANSISTOR DTC144EU
Q802	8-729-403-24	TRANSISTOR XN4210
Q803	8-729-402-19	TRANSISTOR XN6501

RESISTOR

Ref.No	Part No.	Description		Remark
R801	1-216-833-11	METAL GLAZE 10K	5%	1/16W
R803	1-216-833-11	METAL GLAZE 10K	5%	1/16W
R805	1-216-833-11	METAL GLAZE 10K	5%	1/16W
R806	1-216-833-11	METAL GLAZE 10K	5%	1/16W
R809	1-216-833-11	METAL GLAZE 10K	5%	1/16W
R810	1-216-833-11	METAL GLAZE 10K	5%	1/16W
R812	1-216-833-11	METAL GLAZE 10K	5%	1/16W
R815	1-216-833-11	METAL GLAZE 10K	5%	1/16W
R816	1-216-833-11	METAL GLAZE 10K	5%	1/16W
R818	1-216-837-11	METAL GLAZE 22K	5%	1/16W
R819	1-216-829-11	METAL GLAZE 4.7K	5%	1/16W
R820	1-216-845-11	METAL GLAZE 100K	5%	1/16W
R821	1-216-845-11	METAL GLAZE 100K	5%	1/16W
R822	1-216-833-11	METAL GLAZE 10K	5%	1/16W
R823	1-216-825-11	METAL GLAZE 2.2K	5%	1/16W
R824	1-216-833-11	METAL GLAZE 10K	5%	1/16W
R825	1-216-845-11	METAL GLAZE 100K	5%	1/16W
R826	1-216-825-11	METAL GLAZE 2.2K	5%	1/16W
R827	1-216-821-11	METAL GLAZE 1K	5%	1/16W
R828	1-216-825-11	METAL GLAZE 2.2K	5%	1/16W
R829	1-216-825-11	METAL GLAZE 2.2K	5%	1/16W
R830	1-216-817-11	METAL GLAZE 470	5%	1/16W
R831	1-216-817-11	METAL GLAZE 470	5%	1/16W
R832	1-216-833-11	METAL GLAZE 10K	5%	1/16W

NETWORK RESISTOR

Ref.No	Part No.	Description
RB801	1-236-424-11	NETWORK, RES 10K
RB802	1-236-424-11	NETWORK, RES 10K
RB803	1-236-432-11	NETWORK, RES 47K
RB804	1-236-424-11	NETWORK, RES 10K

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*A-7061-851-A VC-60 BOARD, COMPLETE (Ref.No 2,000 Series)
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A-7068-153-A DT-74 BOARD, COMPLETE (HIC)

1-630-593-11 FP-185 FLEXIBLE BOARD
1-630-594-11 FP-186 FLEXIBLE BOARD

CAPACITOR

Ref.No	Part No.	Description		Remark
C102	1-135-162-21	TANTAL. CHIP 33MF	20%	6.3V
C103	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C104	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C105	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C108	1-126-205-11	ELECT CHIP 47MF	20%	6.3V
C109	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C110	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C111	1-162-941-11	CERAMIC CHIP 10PF	0.5PF	50V
C131	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C132	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C133	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C134	1-135-079-21	TANTAL. CHIP 3.3MF	20%	35V
C135	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C141	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C142	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V

When indicating parts by reference number, please include the board name.

VC-60

Ref.No	Part No.	Description		Remark
C143	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C145	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C146	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C150	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C151	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C152	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C153	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C154	1-162-919-11	CERAMIC CHIP 22PF	5%	50V
C156	1-162-910-11	CERAMIC CHIP 5PF	0.25PF	50V
C157	1-162-910-11	CERAMIC CHIP 5PF	0.25PF	50V
C158	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C181	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C182	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C183	1-162-950-11	CERAMIC CHIP 56PF	5%	50V
C184	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C185	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C186	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C187	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C188	1-162-945-11	CERAMIC CHIP 22PF	5%	50V
C189	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C191	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C192	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C195	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C196	1-164-217-11	CERAMIC CHIP 150PF	0.25PF	50V
C197	1-162-922-11	CERAMIC CHIP 39PF	5%	50V
C198	1-162-957-11	CERAMIC CHIP 220PF	5%	50V
C199	1-162-925-11	CERAMIC CHIP 68PF	5%	50V
C200	1-162-919-11	CERAMIC CHIP 22PF	5%	50V
C201	1-162-945-11	CERAMIC CHIP 22PF	5%	50V
C202	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C203	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C204	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C205	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C206	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C210	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C211	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C212	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C213	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C214	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C215	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C216	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C217	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C219	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C220	1-162-638-11	CERAMIC CHIP 1MF		16V
C221	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C222	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C223	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C224	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C225	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C227	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C228	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C229	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C230	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C231	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C232	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C233	1-162-942-11	CERAMIC CHIP 12PF	5%	50V
C234	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C235	1-162-638-11	CERAMIC CHIP 1MF		16V
C236	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C237	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C238	1-162-928-11	CERAMIC CHIP 120PF	5%	50V
C239	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C241	1-162-956-11	CERAMIC CHIP 180PF	5%	50V
C252	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C253	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C254	1-164-005-11	CERAMIC CHIP 0.47MF		25V
C255	1-164-005-11	CERAMIC CHIP 0.47MF		25V
C256	1-164-005-11	CERAMIC CHIP 0.47MF		25V
C261	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C262	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C265	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C266	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C267	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C268	1-162-638-11	CERAMIC CHIP 1MF		16V
C269	1-162-638-11	CERAMIC CHIP 1MF		16V
C272	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C273	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C274	1-162-955-11	CERAMIC CHIP 150PF	5%	50V
C275	1-162-946-11	CERAMIC CHIP 27PF	5%	50V
C276	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C277	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C278	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C279	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C281	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C282	1-162-955-11	CERAMIC CHIP 150PF	5%	50V
C283	1-162-946-11	CERAMIC CHIP 27PF	5%	50V
C301	1-162-943-11	CERAMIC CHIP 15PF	5%	50V
C303	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C304	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C305	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C306	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C307	1-162-915-11	CERAMIC CHIP 10PF	0.5PF	50V
C308	1-164-005-11	CERAMIC CHIP 0.47MF		25V
C309	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C310	1-164-005-11	CERAMIC CHIP 0.47MF		25V
C311	1-162-915-11	CERAMIC CHIP 10PF	0.5PF	50V
C312	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C313	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C315	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C316	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C317	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C318	1-124-566-11	ELECT 120MF	20%	6.3V
C319	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C320	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C321	1-164-156-11	CERAMIC CHIP 0.1MF		25V

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description		Remark
C322	1-162-638-11	CERAMIC CHIP 1MF		16V
C323	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C330	1-162-962-11	CERAMIC CHIP 470PF	10%	50V
C331	1-162-926-11	CERAMIC CHIP 82PF	5%	50V
C332	1-162-919-11	CERAMIC CHIP 22PF	5%	50V
C333	1-162-916-11	CERAMIC CHIP 12PF	5%	50V
C334	1-135-161-21	TANTAL. CHIP 22MF	20%	10V
C336	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C337	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C338	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C339	1-135-181-21	TANTAL. CHIP 4.7MF	20%	6.3V
C340	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C341	1-162-949-11	CERAMIC CHIP 47PF	5%	50V
C360	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C362	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C363	1-135-181-21	TANTAL. CHIP 4.7MF	20%	6.3V
C364	1-135-181-21	TANTAL. CHIP 4.7MF	20%	6.3V
C365	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C366	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V
C367	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V
C368	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V
C369	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C370	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C371	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C372	1-135-072-21	TANTAL. CHIP 0.22MF	20%	35V
C373	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C374	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C375	1-135-181-21	TANTAL. CHIP 4.7MF	20%	6.3V
C376	1-135-181-21	TANTAL. CHIP 4.7MF	20%	6.3V
C377	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C378	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C379	1-135-145-11	TANTAL. CHIP 0.47MF	20%	35V
C380	1-163-115-00	CERAMIC CHIP 82PF	5%	50V
C402	1-162-966-11	CERAMIC CHIP 0.0022MF	10%	50V
C403	1-162-966-11	CERAMIC CHIP 0.0022MF	10%	50V
C404	1-162-966-11	CERAMIC CHIP 0.0022MF	10%	50V
C415	1-162-945-11	CERAMIC CHIP 22PF	5%	50V
C416	1-162-949-11	CERAMIC CHIP 47PF	5%	50V
C417	1-162-927-11	CERAMIC CHIP 100PF	5%	50V
C501	1-135-181-21	TANTAL. CHIP 4.7MF	20%	6.3V
C502	1-162-957-11	CERAMIC CHIP 220PF	5%	50V
C503	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C504	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C505	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C506	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C507	1-162-962-11	CERAMIC CHIP 470PF	10%	50V
C508	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C509	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C510	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C511	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C512	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C513	1-162-910-11	CERAMIC CHIP 5PF	0.5PF	50V
C514	1-162-910-11	CERAMIC CHIP 5PF	0.25PF	50V
C515	1-162-920-11	CERAMIC CHIP 27PF	5%	50V
C516	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C517	1-135-149-21	TANTAL. CHIP 2.2MF	20%	6.3V
C518	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C519	1-162-923-11	CERAMIC CHIP 47PF	5%	50V
C520	1-135-181-21	TANTAL. CHIP 4.7MF	20%	6.3V
C521	1-163-131-00	CERAMIC CHIP 390PF	5%	50V
C522	1-162-959-11	CERAMIC CHIP 330PF	5%	50V
C523	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C524	1-162-947-11	CERAMIC CHIP 33PF	5%	50V
C525	1-162-954-11	CERAMIC CHIP 120PF	5%	50V
C526	1-135-181-21	TANTAL. CHIP 4.7MF	20%	6.3V
C528	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C530	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C536	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C537	1-135-181-21	TANTAL. CHIP 4.7MF	20%	6.3V
C538	1-164-227-11	CERAMIC CHIP 0.022MF	10%	25V
C539	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C540	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C541	1-162-944-11	CERAMIC CHIP 18PF	5%	50V
C545	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C561	1-162-921-11	CERAMIC CHIP 33PF	5%	50V
C562	1-162-916-11	CERAMIC CHIP 12PF	5%	50V
C563	1-162-638-11	CERAMIC CHIP 1MF		16V
C565	1-135-149-21	TANTAL. CHIP 2.2MF	20%	6.3V
C566	1-135-149-21	TANTAL. CHIP 2.2MF	20%	6.3V
C567	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C569	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C570	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C571	1-164-227-11	CERAMIC CHIP 0.022MF	10%	25V
C572	1-162-953-11	CERAMIC CHIP 100PF	5%	50V
C611	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C612	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C613	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C614	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C616	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C617	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C618	1-135-157-21	TANTAL. CHIP 10MF	20%	6.3V
C619	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C620	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C621	1-162-941-11	CERAMIC CHIP 10PF	0.5PF	50V
C622	1-162-974-11	CERAMIC CHIP 0.01MF		50V
C623	1-162-957-11	CERAMIC CHIP 220PF	5%	50V
C624	1-162-957-11	CERAMIC CHIP 220PF	5%	50V
C625	1-162-928-11	CERAMIC CHIP 120PF	5%	50V
C626	1-162-926-11	CERAMIC CHIP 82PF	5%	50V
C627	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C628	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C629	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C631	1-162-966-11	CERAMIC CHIP 0.0022MF	10%	50V
C632	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V
C633	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C634	1-164-156-11	CERAMIC CHIP 0.1MF		25V

When indicating parts by reference number, please include the board name.

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Ref.No	Part No.	Description		Remark
C636	1-162-637-11	CERAMIC CHIP 0.47MF		16V
C637	1-135-150-21	TANTAL. CHIP 3.3MF	20%	6.3V
C638	1-135-147-21	TANTAL. CHIP 1MF	20%	20V
C639	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C640	1-162-964-11	CERAMIC CHIP 0.001MF	10%	50V
C641	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C642	1-162-970-11	CERAMIC CHIP 0.01MF	10%	25V
C643	1-162-957-11	CERAMIC CHIP 220PF	5%	50V
C644	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C647	1-164-156-11	CERAMIC CHIP 0.1MF		25V
C648	1-126-416-11	ELECT 220MF	20%	10V
		CONNECTOR		
CN302	1-568-333-11	CONNECTOR, BOARD TO BOARD 14P		
CN303	1-568-326-11	CONNECTOR, BOARD TO BOARD 7P		
CN304	*1-565-543-11	PIN, CONNECTOR (PC BOARD) 4P		
CN801	1-568-327-11	CONNECTOR, BOARD TO BOARD 8P		
CN802	1-568-366-41	CONNECTOR, BOARD TO BOARD 16P		
CN803	1-568-336-11	CONNECTOR, BOARD TO BOARD 20P		
CN804	1-568-366-41	CONNECTOR, BOARD TO BOARD 16P		
CN805	1-568-359-41	CONNECTOR, BOARD TO BOARD 20P		
CN806	1-568-367-41	CONNECTOR, BOARD TO BOARD 18P		
		TRIMMER		
CT141	1-141-368-11	CAP, CHIP TRIMMER (30P)		
CT142	1-141-366-11	CAP, CHIP TRIMMER		
CT561	1-141-368-11	CAP, CHIP TRIMMER (30P)		
		DIODE		
D101	8-719-404-46	DIODE MA110		
D102	8-719-404-46	DIODE MA110		
D131	8-719-404-32	DIODE MA141WA		
D132	8-719-404-46	DIODE MA110		
D141	8-719-949-48	DIODE 1T32-2		
D142	8-719-949-48	DIODE 1T32-2		
D301	8-719-404-46	DIODE MA110		
D361	8-719-404-32	DIODE MA141WA		
D362	8-719-404-46	DIODE MA110		
D561	8-719-404-49	DIODE MA111		
D562	8-719-420-51	DIODE MA729		
D563	8-719-404-46	DIODE MA110		
D566	8-719-420-51	DIODE MA729		
		FILTER		
FL181	1-236-266-11	FILTER, LOW PASS (YH)		
FL182	1-236-267-11	FILTER, LOW PASS (YDL)		
FL301	1-236-192-11	FILTER, LOW PASS		
FL303	1-415-695-11	DL, LC		
FL304	1-236-265-11	FILTER, BAND PASS		
FL501	1-236-589-11	B.P.F		
FL502	1-415-660-21	DL, LC		
FL503	1-236-450-11	LPF		
FL504	1-236-588-11	B.P.F		

Ref.No	Part No.	Description	Remark
FL610	1-236-209-11	FILTER, LOW PASS	
		IC	
IC141	8-752-329-55	IC CXD1209Q	
IC181	8-752-034-17	IC CXA1338R	
IC182	8-752-330-15	IC CXL1503N	
IC183	8-752-331-32	IC CXL1504N	
IC251	8-752-034-21	IC CXL1504N	
IC252	8-759-946-00	IC MB88341PFV	
IC253	8-752-032-48	IC CXA1157M	
IC301	8-752-033-34	IC CXA1072R	
IC302	8-759-946-00	IC MB88341PFV	
IC303	8-759-101-12	IC UPC311G2	
IC361	8-759-032-00	IC MC68HC05N4-SC406662	
IC362	8-759-937-56	IC S-8054ALB-LM-S	
IC363	8-759-106-23	IC UPD4066BG	
IC364	8-759-100-95	IC UPC324G2	
IC501	8-759-144-23	IC UPC1037GR	
IC502	8-759-144-23	IC UPC1037GR	
IC503	8-752-031-01	IC CXA1047M	
IC561	8-759-146-13	IC UPD7503GF-J36-3B8	
IC610	8-752-329-47	IC CXD1172M	
IC611	8-759-946-00	IC MB88341PFV	
IC612	8-752-326-18	IC CXD1204R	
IC613	8-759-031-79	IC MC68HC05C4-SC403780	
IC615	8-759-100-94	IC UPC358G2	
		COIL	
L101	1-412-031-11	INDUCTOR CHIP 47UH	
L102	1-412-029-11	INDUCTOR CHIP 10UH	
L141	1-410-391-11	INDUCTOR CHIP 68UH	
L142	1-410-381-11	INDUCTOR CHIP 10UH	
L143	1-410-381-11	INDUCTOR CHIP 10UH	
L181	1-410-381-11	INDUCTOR CHIP 10UH	
L182	1-410-381-11	INDUCTOR CHIP 10UH	
L183	1-410-381-11	INDUCTOR CHIP 10UH	
L251	1-410-381-11	INDUCTOR CHIP 10UH	
L301	1-410-381-11	INDUCTOR CHIP 10UH	
L302	1-410-657-21	INDUCTOR CHIP 180UH	
L303	1-410-204-31	INDUCTOR CHIP 10UH	
L361	1-410-381-11	INDUCTOR CHIP 10UH	
L362	1-410-381-11	INDUCTOR CHIP 10UH	
L401	1-216-296-00	METAL GLAZE 0 5% 1/8W	
L402	1-410-192-51	INDUCTOR CHIP 1UH	
L403	1-412-026-11	INDUCTOR CHIP 1UH	
L404	1-410-192-51	INDUCTOR CHIP 1UH	
L501	1-410-381-11	INDUCTOR CHIP 10UH	
L502	1-410-658-31	INDUCTOR CHIP 220UH	
L503	1-410-388-21	INDUCTOR CHIP 39UH	
L509	1-410-381-11	INDUCTOR CHIP 10UH	
L561	1-410-369-11	INDUCTOR CHIP 1UH	
L610	1-410-381-11	INDUCTOR CHIP 10UH	
L611	1-410-381-11	INDUCTOR CHIP 10UH	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
L612	1-410-655-31	INDUCTOR CHIP 120UH	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q101	8-729-402-84	TRANSISTOR XN4601	
Q102	8-729-402-84	TRANSISTOR XN4601	
Q103	8-729-402-84	TRANSISTOR XN4601	
Q104	8-729-402-84	TRANSISTOR XN4601	
Q105	8-729-402-84	TRANSISTOR XN4601	
Q106	8-729-905-23	TRANSISTOR 2SA1576-R	
Q107	8-729-402-84	TRANSISTOR XN4601	
Q131	8-729-421-23	TRANSISTOR XN1216	
Q132	8-729-905-35	TRANSISTOR 2SC4081-R	
Q133	8-729-905-35	TRANSISTOR 2SC4081-R	
Q134	8-729-905-23	TRANSISTOR 2SA1576-R	
Q141	8-729-905-35	TRANSISTOR 2SC4081-R	
Q142	8-729-905-35	TRANSISTOR 2SC4081-R	
Q181	8-729-905-35	TRANSISTOR 2SC4081-R	
Q182	8-729-402-78	TRANSISTOR XN6401	
Q183	8-729-905-23	TRANSISTOR 2SA1576-R	
Q184	8-729-905-35	TRANSISTOR 2SC4081-R	
Q185	8-729-421-23	TRANSISTOR XN1216	
Q186	8-729-905-23	TRANSISTOR 2SA1576-R	
Q187	8-729-905-23	TRANSISTOR 2SA1576-R	
Q188	8-729-905-35	TRANSISTOR 2SC4081-R	
Q189	8-729-905-23	TRANSISTOR 2SA1576-R	
Q190	8-729-905-35	TRANSISTOR 2SC4081-R	
Q191	8-729-402-78	TRANSISTOR XN6401	
Q192	8-729-402-78	TRANSISTOR XN6401	
Q193	8-729-402-78	TRANSISTOR XN6401	
Q194	8-729-905-23	TRANSISTOR 2SA1576-R	
Q195	8-729-905-23	TRANSISTOR 2SA1576-R	
Q196	8-729-905-35	TRANSISTOR 2SC4081-R	
Q254	8-729-402-84	TRANSISTOR XN4601	
Q255	8-729-905-35	TRANSISTOR 2SC4081-R	
Q256	8-729-402-84	TRANSISTOR XN4601	
Q257	8-729-905-35	TRANSISTOR 2SC4081-R	
Q302	8-729-905-23	TRANSISTOR 2SA1576-R	
Q303	8-729-905-23	TRANSISTOR 2SA1576-R	
Q304	8-729-905-35	TRANSISTOR 2SC4081-R	
Q305	8-729-905-35	TRANSISTOR 2SC4081-R	
Q306	8-729-402-84	TRANSISTOR XN4601	
Q307	8-729-905-35	TRANSISTOR 2SC4081-R	
Q308	8-729-905-35	TRANSISTOR 2SC4081-R	
Q309	8-729-905-23	TRANSISTOR 2SA1576-R	
Q361	8-729-403-07	TRANSISTOR XN1213	
Q362	8-729-403-10	TRANSISTOR XN6215	
Q363	8-729-905-35	TRANSISTOR 2SC4081-R	
Q364	8-729-403-10	TRANSISTOR XN6215	
Q365	8-729-402-78	TRANSISTOR XN6401	
Q367	8-729-905-35	TRANSISTOR 2SC4081-R	
Q368	8-729-403-10	TRANSISTOR XN6215	
Q369	8-729-109-44	TRANSISTOR 2SK94	
Q501	8-729-905-35	TRANSISTOR 2SC4081-R	
Q502	8-729-905-35	TRANSISTOR 2SC4081-R	
Q503	8-729-905-23	TRANSISTOR 2SA1576-R	
Q504	8-729-905-35	TRANSISTOR 2SC4081-R	
Q505	8-729-102-06	TRANSISTOR 2SC2223	
Q508	8-729-905-35	TRANSISTOR 2SC4081-R	
Q509	8-729-905-23	TRANSISTOR 2SA1576-R	
Q561	8-729-905-23	TRANSISTOR 2SA1576-R	
Q562	8-729-403-24	TRANSISTOR XN4210	
Q563	8-729-905-18	TRANSISTOR DTC144EU	
Q564	8-729-921-08	TRANSISTOR DTC144TU	
Q565	8-729-402-78	TRANSISTOR XN6401	
Q566	8-729-402-19	TRANSISTOR XN6501	
Q567	8-729-402-78	TRANSISTOR XN6401	
Q568	8-729-109-44	TRANSISTOR 2SK94	
Q569	8-729-905-23	TRANSISTOR 2SA1576-R	
Q570	8-729-905-15	TRANSISTOR DTC144WU	
Q571	8-729-920-39	TRANSISTOR IMT1US	
Q572	8-729-805-25	TRANSISTOR 2SB1121	
Q573	8-729-905-18	TRANSISTOR DTC144EU	
Q610	8-729-403-10	TRANSISTOR XN6215	
Q611	8-729-402-84	TRANSISTOR XN4601	
Q612	8-729-921-08	TRANSISTOR DTC144TU	
Q613	8-729-905-35	TRANSISTOR 2SC4081-R	
Q614	8-729-905-35	TRANSISTOR 2SC4081-R	
Q619	8-729-905-35	TRANSISTOR 2SC4081-R	
Q620	8-729-905-35	TRANSISTOR 2SC4081-R	
Q621	8-729-402-19	TRANSISTOR XN6501	

RESISTOR

Ref.No	Part No.	Description				Remark
R101	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R102	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R103	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R104	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R105	1-216-833-11	METAL GLAZE	10K	5%	1/15W	
R107	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R108	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R109	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R111	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R112	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R113	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R114	1-216-068-00	METAL GLAZE	6.2K	5%	1/10W	
R115	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R116	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R117	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R118	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R119	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R120	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R121	1-216-842-11	METAL GLAZE	56K	5%	1/16W	
R122	1-216-843-11	METAL GLAZE	68K	5%	1/16W	
R123	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R124	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R125	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R126	1-216-809-11	METAL GLAZE	100	5%	1/16W	

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Ref.No	Part No.	Description				Remark
R127	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R128	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R129	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R131	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R132	1-216-844-11	METAL GLAZE	82K	5%	1/16W	
R133	1-216-844-11	METAL GLAZE	82K	5%	1/16W	
R134	1-216-850-11	METAL GLAZE	270K	5%	1/16W	
R135	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R136	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R137	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R138	1-216-844-11	METAL GLAZE	82K	5%	1/16W	
R139	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R140	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R141	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R142	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R143	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R144	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R145	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R147	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R148	1-216-809-11	METAL GLAZE	100	5%	1/16W	
R149	1-216-843-11	METAL GLAZE	68K	5%	1/16W	
R150	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R151	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R152	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R153	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R154	1-216-809-11	METAL GLAZE	100	5%	1/16W	
R155	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R156	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R157	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R158	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R160	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R163	1-216-811-11	METAL GLAZE	150	5%	1/16W	
R165	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R166	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R181	1-216-072-00	METAL GLAZE	9.1K	5%	1/10W	
R182	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R183	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R184	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R185	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R186	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R187	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R188	1-216-812-11	METAL GLAZE	180	5%	1/16W	
R189	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R190	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R192	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R193	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R194	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R195	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R196	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R197	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R198	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R199	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R200	1-216-833-11	METAL GLAZE	10K	5%	1/16W	

Ref.No	Part No.	Description				Remark
R201	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R202	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R203	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R204	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R205	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R206	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R207	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R208	1-216-842-11	METAL GLAZE	56K	5%	1/16W	
R209	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R210	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R211	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R212	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R213	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R214	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R215	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R218	1-216-994-11	METAL GLAZE	13K	5%	1/16W	
R219	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R220	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R221	1-216-834-11	METAL GLAZE	12K	5%	1/16W	
R222	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R223	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R224	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R225	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R226	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R227	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R229	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R230	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R231	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R233	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R252	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R259	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R265	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R266	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R268	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R269	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R270	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R271	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R272	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R273	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R274	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R275	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R276	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R277	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R278	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R279	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R280	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R281	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R282	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R283	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R284	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R285	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R301	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R302	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R303	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R305	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R309	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R310	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R311	1-216-844-11	METAL GLAZE	82K	5%	1/16W	
R312	1-216-844-11	METAL GLAZE	82K	5%	1/16W	
R313	1-216-846-11	METAL GLAZE	120K	5%	1/16W	
R314	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R315	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R316	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R317	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R318	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R319	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R320	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R322	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R323	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R324	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R325	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R326	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R327	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R328	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R329	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R330	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R331	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R332	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R333	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R334	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R335	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R336	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R337	1-216-072-00	METAL GLAZE	9.1K	5%	1/10W	
R338	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R339	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R341	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R342	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R343	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R344	1-216-842-11	METAL GLAZE	56K	5%	1/16W	
R345	1-216-842-11	METAL GLAZE	56K	5%	1/16W	
R346	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R347	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R348	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R349	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R350	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R352	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R361	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R362	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R364	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R365	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R366	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R367	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R368	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R369	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R370	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R371	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R372	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R373	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R374	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R375	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R376	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R377	1-216-847-11	METAL GLAZE	150K	5%	1/16W	
R378	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R379	1-216-851-11	METAL GLAZE	330K	5%	1/16W	
R380	1-216-851-11	METAL GLAZE	330K	5%	1/16W	
R381	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R382	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R383	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R384	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R385	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R401	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R402	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R403	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R404	1-216-843-11	METAL GLAZE	68K	5%	1/16W	
R405	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R406	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R407	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R408	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R409	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R410	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R411	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R412	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R413	1-216-813-11	METAL GLAZE	220	5%	1/16W	
R415	1-216-813-11	METAL GLAZE	220	5%	1/16W	
R416	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R417	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R418	1-216-813-11	METAL GLAZE	220	5%	1/16W	
R419	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R420	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R422	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R423	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R424	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R425	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R426	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R427	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R428	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R429	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R430	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R431	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R433	1-216-813-11	METAL GLAZE	220	5%	1/16W	
R434	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R435	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R436	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R437	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R438	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R439	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R441	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R442	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R443	1-216-864-11	METAL GLAZE	0	5%	1/16W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R503	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R505	1-216-819-11	METAL GLAZE	680	5%	1/16W	
R506	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R507	1-216-837-11	METAL GLAZE	22K	5%	1/16W	
R508	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R509	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R510	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R511	1-216-820-11	METAL GLAZE	820	5%	1/16W	
R512	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R513	1-216-842-11	METAL GLAZE	56K	5%	1/16W	
R514	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R515	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R516	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W	
R517	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R518	1-216-677-11	METAL CHIP	12K	0.50%	1/10W	
R519	1-216-671-11	METAL CHIP	6.8K	0.50%	1/10W	
R520	1-216-679-11	METAL CHIP	15K	0.50%	1/10W	
R521	1-216-679-11	METAL CHIP	15K	0.50%	1/10W	
R522	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R523	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R524	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R525	1-216-853-11	METAL GLAZE	470K	5%	1/16W	
R526	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R527	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R528	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R529	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R530	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R531	1-216-818-11	METAL GLAZE	560	5%	1/16W	
R532	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R533	1-216-835-11	METAL GLAZE	15K	5%	1/16W	
R534	1-216-817-11	METAL GLAZE	470	5%	1/16W	
R535	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R541	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R542	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R543	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R547	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W	
R548	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R549	1-216-819-11	METAL GLAZE	680	5%	1/16W	
R550	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R551	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R552	1-216-826-11	METAL GLAZE	2.7K	5%	1/16W	
R561	1-216-849-11	METAL GLAZE	220K	5%	1/16W	
R562	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R563	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R564	1-216-851-11	METAL GLAZE	330K	5%	1/16W	
R565	1-216-841-11	METAL GLAZE	47K	5%	1/16W	
R566	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R567	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R568	1-216-097-00	METAL GLAZE	100K	1%	1/10W	
R569	1-216-852-11	METAL GLAZE	390K	5%	1/16W	
R570	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R571	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R572	1-216-845-11	METAL GLAZE	100K	5%	1/16W	

Ref.No	Part No.	Description				Remark
R573	1-216-851-11	METAL GLAZE	330K	5%	1/16W	
R574	1-216-809-11	METAL GLAZE	100	5%	1/16W	
R575	1-216-861-11	METAL GLAZE	2.2M	5%	1/16W	
R576	1-216-839-11	METAL GLAZE	33K	5%	1/16W	
R577	1-216-843-11	METAL GLAZE	68K	5%	1/16W	
R578	1-216-136-00	METAL GLAZE	2.7	5%	1/8W	
R579	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W	
R580	1-216-822-11	METAL GLAZE	1.2K	5%	1/16W	
R581	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R582	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R583	1-218-172-11	METAL GLAZE	680K	1%	1/10W	
R584	1-218-172-11	METAL GLAZE	680K	1%	1/10W	
R585	1-216-836-11	METAL GLAZE	18K	5%	1/16W	
R587	1-216-807-11	METAL GLAZE	68	5%	1/16W	
R611	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R613	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R614	1-216-840-11	METAL GLAZE	39K	5%	1/16W	
R615	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R616	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W	
R617	1-216-864-11	METAL GLAZE	0	5%	1/16W	
R618	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W	
R619	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R620	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R621	1-216-857-11	METAL GLAZE	1M	5%	1/16W	
R622	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R623	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R624	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R625	1-216-838-11	METAL GLAZE	27K	5%	1/16W	
R626	1-216-842-11	METAL GLAZE	56K	5%	1/16W	
R627	1-216-845-11	METAL GLAZE	100K	5%	1/16W	
R628	1-216-849-11	METAL GLAZE	220K	5%	1/16W	
R629	1-216-832-11	METAL GLAZE	8.2K	5%	1/16W	
R630	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R631	1-216-844-11	METAL GLAZE	82K	5%	1/16W	
R632	1-216-819-11	METAL GLAZE	680	5%	1/16W	
R633	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R634	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R635	1-216-853-11	METAL GLAZE	470K	5%	1/16W	
R636	1-216-825-11	METAL GLAZE	2.2K	5%	1/16W	
R638	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R639	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R640	1-216-827-11	METAL GLAZE	3.3K	5%	1/16W	
R641	1-216-818-11	METAL GLAZE	560	5%	1/16W	
R642	1-216-833-11	METAL GLAZE	10K	5%	1/16W	
R643	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R644	1-216-824-11	METAL GLAZE	1.8K	5%	1/16W	
R645	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W	
R647	1-216-821-11	METAL GLAZE	1K	5%	1/16W	
R648	1-216-809-11	METAL GLAZE	100	5%	1/16W	
R649	1-216-685-11	METAL CHIP	27K	0.50%	1/10W	
R650	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R651	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R653	1-216-840-11	METAL GLAZE	39K	5%	1/16W	

When indicating parts by reference number, please include the board name.

VF-19 TL-26 PD-18

Ref.No	Part No.	Description	Remark
R958	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R959	1-216-113-00	METAL GLAZE 470K 5% 1/10W	
R960	1-216-053-00	METAL GLAZE 1.5K 5% 1/10W	
R961	1-216-160-00	METAL GLAZE 27 5% 1/8W	
R962	1-216-336-11	METAL GLAZE 47K 1% 1/10W	
R963	1-216-107-00	METAL GLAZE 270K 5% 1/10W	
R964	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R965	1-216-308-00	METAL GLAZE 4.7 5% 1/10W	
R967	1-216-047-00	METAL GLAZE 820 5% 1/10W	
R968	1-216-069-00	METAL GLAZE 6.8K 5% 1/10W	
R969	1-216-748-11	METAL GLAZE 39K 5% 1/10W	
R970	1-216-748-11	METAL GLAZE 39K 5% 1/10W	
R971	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R972	1-216-101-00	METAL GLAZE 150K 5% 1/10W	
R973	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R974	1-216-131-11	METAL GLAZE 2.7M 5% 1/10W	
R975	1-216-131-11	METAL GLAZE 2.7M 5% 1/10W	
R976	1-216-055-00	METAL GLAZE 1.8K 5% 1/10W	
R978	1-216-051-00	METAL GLAZE 1.2K 5% 1/10W	
R983	1-216-121-00	METAL GLAZE 1M 5% 1/10W	

VARIABLE RESISTOR

Ref.No	Part No.	Description
RV951	1-238-092-11	RES, ADJ CERMET 47K
RV952	1-238-086-11	RES, ADJ CERMET 470
RV953	1-238-088-11	RES, ADJ, CERMET 2.2K
RV954	1-238-561-11	RES, ADJ, METAL GLAZE 1M

TRANSFORMER

Ref.No	Part No.	Description
T951	⚠.1-439-431-21	TRANSFORMER ASSY, FLYBACK

THERMISTOR

Ref.No	Part No.	Description
TH951	1-807-938-11	THERMISTOR

SOCKET

Ref.No	Part No.	Description
W952	⚠.1-540-019-21	SOCKET ASSY, CRT

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*1-630-588-21 TL-26 BOARD (Ref.No 9,000 Series)
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DIODE

Ref.No	Part No.	Description
D952	8-719-941-34	DIODE GLIHD51

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*A-7061-855-A PD-18 BOAR, COMPLETE (Ref.No 4,000 Series)
****

CAPACITOR

Ref.No	Part No.	Description	Remark
C201	1-163-086-00	CERAMIC CHIP 3PF 0.25PF 50V	
C202	1-164-232-11	CERAMIC CHIP 0.01MF 10% 50V	
C203	1-163-033-00	CERAMIC CHIP 0.022MF 50V	
C204	1-164-232-11	CERAMIC CHIP 0.01MF 10% 50V	
C205	1-164-232-11	CERAMIC CHIP 0.01MF 10% 50V	
C206	1-163-131-00	CERAMIC CHIP 390PF 5% 50V	
C207	1-164-232-11	CERAMIC CHIP 0.01MF 10% 50V	
C208	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C209	1-163-109-00	CERAMIC CHIP 47PF 5% 50V	
C210	1-163-015-00	CERAMIC CHIP 0.0033MF 10% 50V	
C211	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C212	1-164-232-11	CERAMIC CHIP 0.01MF 10% 50V	
C213	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C214	1-135-157-21	TANTAL. CHIP 10MF 20% 6.3V	

DIODE

Ref.No	Part No.	Description
D201	8-719-800-76	DIODE 1SS226

FILTER

Ref.No	Part No.	Description
FL201	1-236-188-21	FILTER, BAND PASS
FL202	1-415-664-11	DELAY LINE, ULTRASONIC 2H

COIL

Ref.No	Part No.	Description
L201	1-410-383-31	INDUCTOR CHIP 15UH
L202	1-410-385-11	INDUCTOR CHIP 22UH
L203	1-410-381-11	INDUCTOR CHIP 10UH

TRANSISTOR

Ref.No	Part No.	Description
Q201	8-729-100-66	TRANSISTOR 2SC1623-L6
Q202	8-729-100-66	TRANSISTOR 2SC1623-L6
Q203	8-729-100-66	TRANSISTOR 2SC1623-L6
Q204	8-729-100-66	TRANSISTOR 2SC1623-L6
Q205	8-729-100-66	TRANSISTOR 2SC1623-L6
Q206	8-729-100-66	TRANSISTOR 2SC1623-L6
Q207	8-729-100-66	TRANSISTOR 2SC1623-L6
Q208	8-729-100-66	TRANSISTOR 2SC1623-L6

RESISTOR

Ref.No	Part No.	Description
R201	1-216-049-00	METAL GLAZE 1K 5% 1/10W
R202	1-216-049-00	METAL GLAZE 1K 5% 1/10W
R203	1-216-077-00	METAL GLAZE 15K 5% 1/10W
R204	1-216-041-00	METAL GLAZE 470 5% 1/10W
R205	1-216-033-00	METAL GLAZE 220 5% 1/10W
R206	1-216-049-00	METAL GLAZE 1K 5% 1/10W
R207	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W
R208	1-216-073-00	METAL GLAZE 10K 5% 1/10W
R209	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W
R210	1-216-039-00	METAL GLAZE 390 5% 1/10W
R211	1-216-047-00	METAL GLAZE 820 5% 1/10W
R212	1-216-059-00	METAL GLAZE 2.7K 5% 1/10W
R213	1-216-041-00	METAL GLAZE 470 5% 1/10W
R214	1-216-053-00	METAL GLAZE 1.5K 5% 1/10W
R215	1-216-085-00	METAL GLAZE 33K 5% 1/10W
R216	1-216-081-00	METAL GLAZE 22K 5% 1/10W
R217	1-216-041-00	METAL GLAZE 470 5% 1/10W
R218	1-216-043-00	METAL GLAZE 560 5% 1/10W
R219	1-216-027-00	METAL GLAZE 120 5% 1/10W

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
R654	1-216-864-11	METAL GLAZE 0 5% 1/16W	
R656	1-216-828-11	METAL GLAZE 3.9K 5% 1/16W	
R657	1-216-818-11	METAL GLAZE 560 5% 1/16W	
R659	1-216-844-11	METAL GLAZE 82K 5% 1/16W	
R661	1-216-813-11	METAL GLAZE 220 5% 1/16W	
R662	1-216-813-11	METAL GLAZE 220 5% 1/16W	
R663	1-216-813-11	METAL GLAZE 220 5% 1/16W	
R664	1-216-827-11	METAL GLAZE 3.3K 5% 1/16W	
R665	1-216-830-11	METAL GLAZE 5.6K 5% 1/16W	

NETWORK RESISTOR

Ref.No	Part No.	Description
RB101	1-236-436-11	NETWORK, RES 100K
RB141	1-236-416-11	NETWORK, RES 2.2K
RB181	1-236-414-11	NETWORK, RES 1.5K
RB182	1-236-412-11	NETWORK, RES 1.0K
RB183	1-236-423-11	NETWORK, RES 8.2K
RB184	1-236-423-11	NETWORK, RES 8.2K
RB251	1-236-428-11	NETWORK, RES 22K
RB252	1-236-412-11	NETWORK, RES 1.0K
RB253	1-236-412-11	NETWORK, RES 1.0K
RB301	1-236-412-11	NETWORK, RES 1.0K
RB362	1-236-436-11	NETWORK, RES 100K
RB363	1-236-424-11	NETWORK, RES 10K
RB561	1-236-436-11	NETWORK, RES 100K
RB562	1-236-436-11	NETWORK, RES 100K
RB563	1-236-412-11	NETWORK, RES 1.0K
RB564	1-236-436-11	NETWORK, RES 100K
RB565	1-236-436-11	NETWORK, RES 100K
RB566	1-236-436-11	NETWORK, RES 100K
RB567	1-236-412-11	NETWORK, RES 1.0K
RB568	1-236-412-11	NETWORK, RES 1.0K
RB569	1-236-412-11	NETWORK, RES 1.0K
RB570	1-236-432-11	NETWORK, RES 47K
RB571	1-236-412-11	NETWORK, RES 1.0K
RB572	1-236-412-11	NETWORK, RES 1.0K
RB574	1-236-436-11	NETWORK, RES 100K
RB575	1-236-436-11	NETWORK, RES 100K
RB576	1-236-424-11	NETWORK, RES 10K
RB577	1-236-424-11	NETWORK, RES 10K
RB611	1-236-424-11	NETWORK, RES 10K
RB612	1-236-436-11	NETWORK, RES 100K

VARIABLE RESISTOR

Ref.No	Part No.	Description
RV501	1-238-089-11	RES, ADJ CERMET 4.7K
RV502	1-238-089-11	RES, ADJ CERMET 4.7K
RV503	1-238-088-11	RES, ADJ, CERMET 2.2K
RV504	1-238-087-11	RES, ADJ CERMET 1K
RV505	1-238-087-11	RES, ADJ CERMET 1K
RV561	1-238-093-11	RES, ADJ CERMET 100K

CRYSTAL

Ref.No	Part No.	Description	Remark
X101	1-577-119-11	OSCILLATOR, CRYSTAL	
X141	1-567-733-11	VIBRATOR, CRYSTAL	
X361	1-577-118-11	VIBRATOR, LITHIUM NIOBATE	
X561	1-527-997-21	VIBRATOR, CRYSTAL	

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*A-7061-853-A VF-19 BOAR, COMPLETE (Ref.No 8,000 Series)
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CAPACITOR

Ref.No	Part No.	Description				
C951	1-124-442-00	ELECT	330MF	20%	6.3V
C953	1-163-077-00	CERAMIC CHIP	0.1MF		50V
C954	1-135-091-00	TANTAL. CHIP	1MF	20%	16V
C955	1-163-037-11	CERAMIC CHIP	0.022MF	10%	25V
C956	1-131-381-00	TANTALUM	47MF	10%	6.3V
C957	1-163-081-00	CERAMIC CHIP	0.22MF		25V
C958	1-136-718-11	TANTAL CHIP	0.1MF	5%	25V
C959	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C960	1-124-587-11	ELECT	220MF	20%	6.3V
C961	⚠.1-163-205-00	CERAMIC CHIP	0.001MF	10%	50V
C962	⚠.1-162-625-11	CERAMIC CHIP	0.0047MF	5%	50V
C963	⚠.1-162-625-11	CERAMIC CHIP	0.0047MF	5%	50V
C964	⚠.1-163-209-00	CERAMIC CHIP	0.0015MF	5%	50V
C965	1-126-090-11	ELECT	82MF	20%	10V
C966	1-124-257-00	ELECT	2.2MF	20%	35V
C968	1-163-037-11	CERAMIC CHIP	0.022MF	10%	25V
C969	1-102-038-00	CERAMIC	0.001MF		500V

CONNECTOR

Ref.No	Part No.	Description
CN952	*1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P
CN953	*1-566-195-21	PIN, CONNECTOR (PC BOARD) 2P

DIODE

Ref.No	Part No.	Description
D951	8-719-820-65	DIODE TLS221
D953	8-719-400-20	DIODE MA152WA

IC

Ref.No	Part No.	Description
IC951	8-759-420-01	IC AN2512S

COIL

Ref.No	Part No.	Description	
L951	1-410-831-21	INDUCTOR	82UH
L952	1-408-785-21	INDUCTOR CHIP	47UH
L953	⚠.1-459-858-11	COIL, FERRITE (HLC)	

TRANSISTOR

Ref.No	Part No.	Description
Q953	8-729-216-31	TRANSISTOR 2SA1163-G
Q954	8-729-100-66	TRANSISTOR 2SC1623-L6
Q955	8-729-106-68	TRANSISTOR 2SD1615A-GP

RESISTOR

Ref.No	Part No.	Description			
R953	1-216-041-00	METAL GLAZE	470	5%	1/10W
R955	1-216-005-00	METAL GLAZE	15	5%	1/10W
R956	1-216-121-00	METAL GLAZE	1M	5%	1/10W
R957	1-216-041-00	METAL GLAZE	470	5%	1/10W

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
R220	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W	
R221	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R222	1-216-047-00	METAL GLAZE 820 5% 1/10W	
R223	1-216-037-00	METAL GLAZE 330 5% 1/10W	
R224	1-216-047-00	METAL GLAZE 820 5% 1/10W	
R225	1-216-037-00	METAL GLAZE 330 5% 1/10W	
R226	1-216-085-00	METAL GLAZE 33K 5% 1/10W	
R227	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R228	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R229	1-216-079-00	METAL GLAZE 18K 5% 1/10W	

VARIABLE RESISTOR

Ref.No	Part No.	Description	Remark
RV201	1-238-089-11	RES, ADJ CERMET 4.7K	

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1-630-589-11 JK-40 FLEXIBLE BOARD (Rfe.No 7,000 Series)
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JACK

Ref.No	Part No.	Description	Remark
J901	1-537-142-11	TERMINAL BOARD (V-RFU DC OUT-A)	

SWITCH

Ref.No	Part No.	Description	Remark
S921	1-570-134-11	SWITCH, SLIDE (INPUT/OUTPUT)	

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*A-7070-966-A CD-14 BOARD, COMPLETE (Ref.No 1,000 Series)
****

CAPACITOR

Ref.No	Part No.	Description	Remark
C901	1-163-133-00	CERAMIC CHIP 470PF 5% 50V	
C902	1-162-638-11	CERAMIC CHIP 1MF 16V	
C903	1-135-089-21	TANTAL. CHIP 6.8MF 20% 20V	
C904	1-162-970-11	CERAMIC CHIP 0.01MF 10% 25V	
C905	1-135-147-21	TANTAL. CHIP 1MF 20% 20V	
C906	1-162-995-11	CERAMIC CHIP 0.022MF 50V	
C907	1-135-162-21	TANTAL. CHIP 33MF 20% 6.3V	
C908	1-162-995-11	CERAMIC CHIP 0.022MF 50V	
C909	1-135-155-21	TANTAL. CHIP 4.7MF 20% 16V	
C910	1-162-995-11	CERAMIC CHIP 0.022MF 50V	
C911	1-162-637-11	CERAMIC CHIP 0.47MF 16V	

CONNECTOR

Ref.No	Part No.	Description	Remark
CN301	1-568-365-41	CONNECTOR, BOARD TO BOARD 14P	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q901	8-729-105-53	TRANSISTOR 2SK300-3	

RESISTOR

Ref.No	Part No.	Description	Remark
R901	1-216-817-11	METAL GLAZE 470 5% 1/16W	
R902	1-216-828-11	METAL GLAZE 3.9K 5% 1/16W	
R903	1-216-848-11	METAL GLAZE 180K 5% 1/16W	
R904	1-216-838-11	METAL GLAZE 27K 5% 1/16W	
R905	1-216-809-11	METAL GLAZE 100 5% 1/16W	
R906	1-216-819-11	METAL GLAZE 680 5% 1/16W	
R907	1-216-837-11	METAL GLAZE 22K 5% 1/16W	

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*A-7070-968-A EL-1 BOARD, COMPLETE (Ref.No 5,000 Series)
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CAPACITOR

Ref.No	Part No.	Description	Remark
C942	1-162-964-11	CERAMIC CHIP 0.001MF 10% 50V	
C943	1-162-964-11	CERAMIC CHIP 0.001MF 10% 50V	
C944	1-162-964-11	CERAMIC CHIP 0.001MF 10% 50V	
C945	1-162-964-11	CERAMIC CHIP 0.001MF 10% 50V	

CONNECTOR

Ref.No	Part No.	Description	Remark
CN941	1-566-757-11	PIN, CONNECTOR (PC BOARD) 2P	
CN942	*1-566-758-11	PIN, CONNECTOR (PC BOARD) 3P	
CN943	*1-565-541-11	PIN, CONNECTOR (PC BOARD) 2P	

DIODE

Ref.No	Part No.	Description	Remark
D941	8-719-420-15	DIODE MA8082-M	
D942	8-719-106-71	DIODE RD12M-B2	
D943	8-719-941-86	DIODE DAN202U	
D944	8-719-420-15	DIODE MA8082-M	
D945	8-719-420-15	DIODE MA8082-M	

JACK

Ref.No	Part No.	Description	Remark
J902	1-565-276-11	JACK, ULTRA SMALL 1P (REMOTE)	
J903	1-568-027-11	JACK, SMALL TYPE 1P (②)	

COIL

Ref.No	Part No.	Description	Remark
L941	1-410-369-11	INDUCTOR CHIP 1UH	
L942	1-410-369-11	INDUCTOR CHIP 1UH	
L943	1-410-369-11	INDUCTOR CHIP 1UH	
L944	1-410-369-11	INDUCTOR CHIP 1UH	
L945	1-410-369-11	INDUCTOR CHIP 1UH	

RESISTOR

Ref.No	Part No.	Description	Remark
R941	1-216-295-00	METAL GLAZE 0 5% 1/10W	

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*A-7070-969-A MA-32 BOARD, COMPLETE (Ref.No 4,000 Series)
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CAPACITOR

Ref.No	Part No.	Description	Remark
C401	1-162-964-11	CERAMIC CHIP 0.001MF 10% 50V	
C402	1-164-247-11	CERAMIC CHIP 0.047MF 10% 16V	
C403	1-164-247-11	CERAMIC CHIP 0.047MF 10% 16V	
C404	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C406	1-164-247-11	CERAMIC CHIP 0.047MF 10% 16V	
C407	1-162-964-11	CERAMIC CHIP 0.001MF 10% 50V	
C408	1-164-156-11	CERAMIC CHIP 0.1MF 25V	
C409	1-124-967-11	ELECT 10MF 20% 10V	
C410	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C411	1-135-181-21	TANTAL. CHIP 4.7MF 20% 6.3V	

When indicating parts by reference number, please include the board name.

MA-32

Ref.No	Part No.	Description			Remark
C412	1-135-181-21	TANTAL. CHIP	4.7MF	20%	6.3V
C413	1-126-205-11	ELECT CHIP	47MF	20%	6.3V
C414	1-162-964-11	CERAMIC CHIP	0.001MF	10%	50V
C415	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C416	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V
C418	1-163-022-00	CERAMIC CHIP	0.012MF	10%	50V
C419	1-163-022-00	CERAMIC CHIP	0.012MF	10%	50V
C420	1-163-022-00	CERAMIC CHIP	0.012MF	10%	50V
C481	1-163-022-00	CERAMIC CHIP	0.012MF	10%	50V

CONNECTOR

Ref.No	Part No.	Description
CN404	*1-565-543-11	PIN, CONNECTOR (PC BOARD) 4P
CN405	*1-566-758-11	PIN, CONNECTOR (PC BOARD) 3P

DIODE

Ref.No	Part No.	Description
D401	8-719-420-15	DIODE MA8082-M

JACK

Ref.No	Part No.	Description
J904	1-568-027-11	JACK, SMALL TYPE 1P (MIC PLUG IN POWER)

TRANSISTOR

Ref.No	Part No.	Description
Q401	8-729-905-23	TRANSISTOR 2SA1576-R
Q402	8-729-905-35	TRANSISTOR 2SC4081-R
Q403	8-729-905-35	TRANSISTOR 2SC4081-R
Q404	8-729-905-35	TRANSISTOR 2SC4081-R
Q405	8-729-905-35	TRANSISTOR 2SC4081-R
Q481	8-729-905-35	TRANSISTOR 2SC4081-R

RESISTOR

Ref.No	Part No.	Description			Remark
R401	1-216-823-11	METAL GLAZE	1.5K	5%	1/16W
R402	1-216-834-11	METAL GLAZE	12K	5%	1/16W
R403	1-216-844-11	METAL GLAZE	82K	5%	1/16W
R404	1-216-845-11	METAL GLAZE	100K	5%	1/16W
R405	1-216-830-11	METAL GLAZE	5.6K	5%	1/16W
R406	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W
R407	1-216-836-11	METAL GLAZE	18K	5%	1/16W
R408	1-216-831-11	METAL GLAZE	6.8K	5%	1/16W
R409	1-216-836-11	METAL GLAZE	18K	5%	1/16W
R410	1-216-810-11	METAL GLAZE	120	5%	1/16W
R411	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R412	1-216-836-11	METAL GLAZE	18K	5%	1/16W
R413	1-216-821-11	METAL GLAZE	1K	5%	1/16W
R414	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W
R415	1-216-833-11	METAL GLAZE	10K	5%	1/16W
R416	1-216-815-11	METAL GLAZE	330	5%	1/16W
R417	1-216-828-11	METAL GLAZE	3.9K	5%	1/16W
R418	1-216-675-11	METAL CHIP	10K	0.50%	1/10W
R419	1-216-675-11	METAL CHIP	10K	0.50%	1/10W
R420	1-216-675-11	METAL CHIP	10K	0.50%	1/10W
R481	1-216-675-11	METAL CHIP	10K	0.50%	1/10W
R482	1-216-829-11	METAL GLAZE	4.7K	5%	1/16W
R483	1-216-811-11	METAL GLAZE	150	5%	1/16W
R484	1-216-296-00	METAL GLAZE	0	5%	1/8W

****

MISCELLANEOUS
****

Ref.No	Part No.	Description
	1-466-146-11	SWITCH BLOCK, FK-9 (E, Australian MODEL)
	1-466-147-11	SWITCH BLOCK, CF-4
	⚠.1-466-148-21	CONVERTER UNIT, DC-DC
	1-466-149-21	SWITCH BLOCK, FK-9 (AEP, UK MODEL)
	1-537-217-21	TERMINAL BOARD, BATTERY
	1-542-126-11	MICROPHONE UNIT
	1-547-335-11	LENS, ZOOM (VCL-1106XA)
	1-547-357-11	FILTER BLOCK KIT OPTICAL (OFB-02-02)
	1-568-335-11	CONNECTOR, BOARD TO BOARD 18P
	1-627-722-11	FP-149 FLEXIBLE BOARD
	1-808-753-11	DISPLAY BLOCK, LIQUID CRYSTAL
IC901	A-7091-132-A	ICX-027BK ASSY (CCD IMAGER)
M901	A-7048-214-A	DRUM BLOCK ASSY (DGH-37A-R)
M902	8-835-329-01	MOTOR, DC U-21A (CAPSTAN)
M903	1-541-607-11	MOTOR, DC (LA12G-344VA) (LOADING)
M904	3-707-660-01	METER ASSY, EE (IRIS)
M905	3-707-659-01	MOTOR ASSY, AF/Z GEAR (FOCUS/ZOOM)
PS901	⚠.1-532-841-21	LINK, IC PRF1600 (1.6A)
PS902	⚠.1-532-841-21	LINK, IC PRF1600 (1.6A)
PS903	⚠.1-532-841-21	LINK, IC PRF1600 (1.6A)
S901	3-707-662-01	SW ASSY, LEAF (FOCUS END SWITCH)
V901	⚠.1-452-482-31	CRT ASSY (M91JYZ60WB)

****

ACCESSORIES AND PACKING MATERIALS
****

Part No.	Description	Remark
*3-704-281-01	BAG, PROTECTION (STANDARD)	
3-707-568-01	ADAPTOR, LENS HOOD	
*3-736-301-01	CUSHION (UPPER)	
*3-736-302-01	CUSHION (LOWER)	
3-750-315-41	MANUAL, INSTRUCTION (ENGLISH) (AEP/UK MODEL)	
3-750-315-51	MANUAL, INSTRUCTION (FRENCH, GERMAN, SPANISH) (AEP MODEL)	
3-750-315-61	MANUAL, INSTRUCTION (DUTCH, SWEDISH, ITALIAN) (AEP MODEL)	
3-751-075-11	MANUAL, INSTRUCTION (ENGLISH) (E/Australian MODEL)	
3-751-075-41	MANUAL, INSTRUCTION (FRENCH, GERMAN, SPANISH) (E MODEL)	
3-751-075-51	MANUAL, INSTRUCTION (ARABIC) (E MODEL)	
*3-764-631-12	INSTRUCTION, DEW CONDENSATION	

**** ACCESSORIES AND PACKING MATERIALS (KIT) ****

Part No.	Description
A-6767-706-A	RFU ADAPTOR RFU-89EA (AEP/E MODEL)
A-6767-707-A	RFU ADAPTOR RFU-89EA (UK MODEL)
A-6767-772-A	RFU ADAPTOR RFU-89EA (Australian MODEL)

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Part No.	Description	Remark
1-571-164-11	SWITCH, ANTENNA CHANGE (CABLE)	
3-712-595-21	BELT, SHOULDER	
3-712-673-01	SCREWDRIVER	
*3-736-870-21	SLEEVE, ACC KIT	
*3-736-871-21	INDIVIDUAL CARTON	
*3-736-874-01	CUSHION (UPPER), ACC	
*3-736-875-01	CUSHION (INNER), ACC	
*3-736-876-01	CUSHION (LOWER), ACC	
** AC-V30	AC POWER ADAPTOR	
*** NP-55	BATTERY PACK	

Note

** MARK PARTS IS AVAILABLE FOR REPAIR SERVICE.
*** MARK PARTS IS AVAILABLE AS AN OPTIONAL ACCESSORY.

****

HARDWARE LIST
****

SCREW

7-621-281-15	SCREW +P 2X2
7-621-772-00	SCREW +B 2X3

STOP RING

7-624-102-04	STOP RING 1.5, TYPE -E

STEEL BALL

7-671-112-01	STEEL, BALL

****

When indicating parts by reference number, please include the board name.

SECTION 7
CAMERA ADJUSTMENTS

During the adjustment, see the arrangement diagram for adjustment parts from page 286.

7-1. PRE-ADJUSTMENT PREPARATIONS (CAMERA BLOCK)

7-1-1. List of Servicing Jigs

- Oscilloscope
- Regulated power supply (2 units)
- Adjusting screwdriver
- Color monitor
- Vectorscope
- Digital voltmeter

Ref. No.	Part Name	Part No.	Use
J-1	Filter (C14) for color temperature correction (Combination of C2 and C12)	J-6080-058-A	Auto white balance confirmation
J-2	ND filter 1.0	J-6080-808-A	Max. gain adjustment (two filters used)
	ND filter 0.4	J-6080-806-A	Iris adjustment, iris in/out adjustment (two used)
	ND filter 0.3	J-6080-818-A	Max. gain adjustment
	ND filter 0.1	J-6080-807-A	Iris adjustment, iris in/out adjustment
J-3	Pattern box PTB-450*	J- - -	
J-4	Pattern box color chart	J-6020-250-A	
J-5	Siemens star	J-6080-875-A	For flange back adjustment
J-6	AF microprocessor data reading jig	J-6082-025-A	
J-7	Adjustment remote controller	J-6082-053-A	
J-8	Extension cord (16P)	J-6082-062-A	Extension for CF-4 (operation switch) block (during operation)
	Extension cord (14P)	J-6082-061-A	Extension cord for CD-14 board (when repairing VC-60 board)
	Extension cord (20P)	J-6082-063-A	Extension cord for LD-11 board (when repairing VC-60 board)
			Extension cord for TI-15 board (when repairing TI-15 board)
J-9	Extension cord (10P)	J-6082-064-A	Extension cord for JK-40 board (when repairing VS-37 board)

* PTB-500 (J-6029-140-A) can also be used.

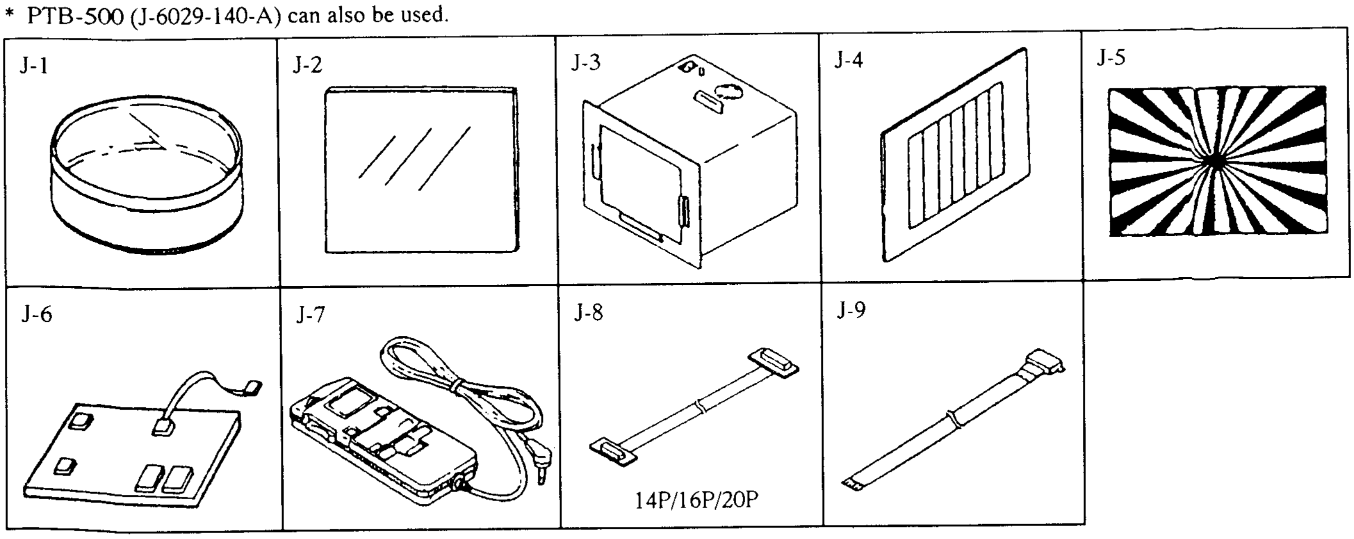


Fig. 7-1.

7-1-2. Preparations

Note: Refer to "2. DISASSEMBLY" for details on removal of the cabinet and various boards.

1) Connect the various devices for adjustment as shown in Fig. 7-3.
2) The EVF (electronic viewfinder) is needed for confirmation of the white balance mode and shutter speed. Remove CN205 on the VS-37 board when the EVF is not needed.
3) The mic amplifier (MA-32 board) is not needed. Remove CN402 on the AU-51 board.

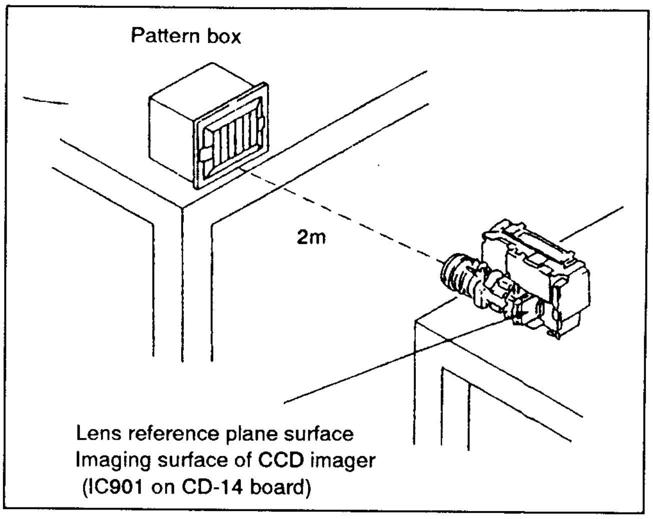

Pattern box
2m
Lens reference plane surface
Imaging surface of CCD imager
(IC901 on CD-14 board)

Fig. 7-2.

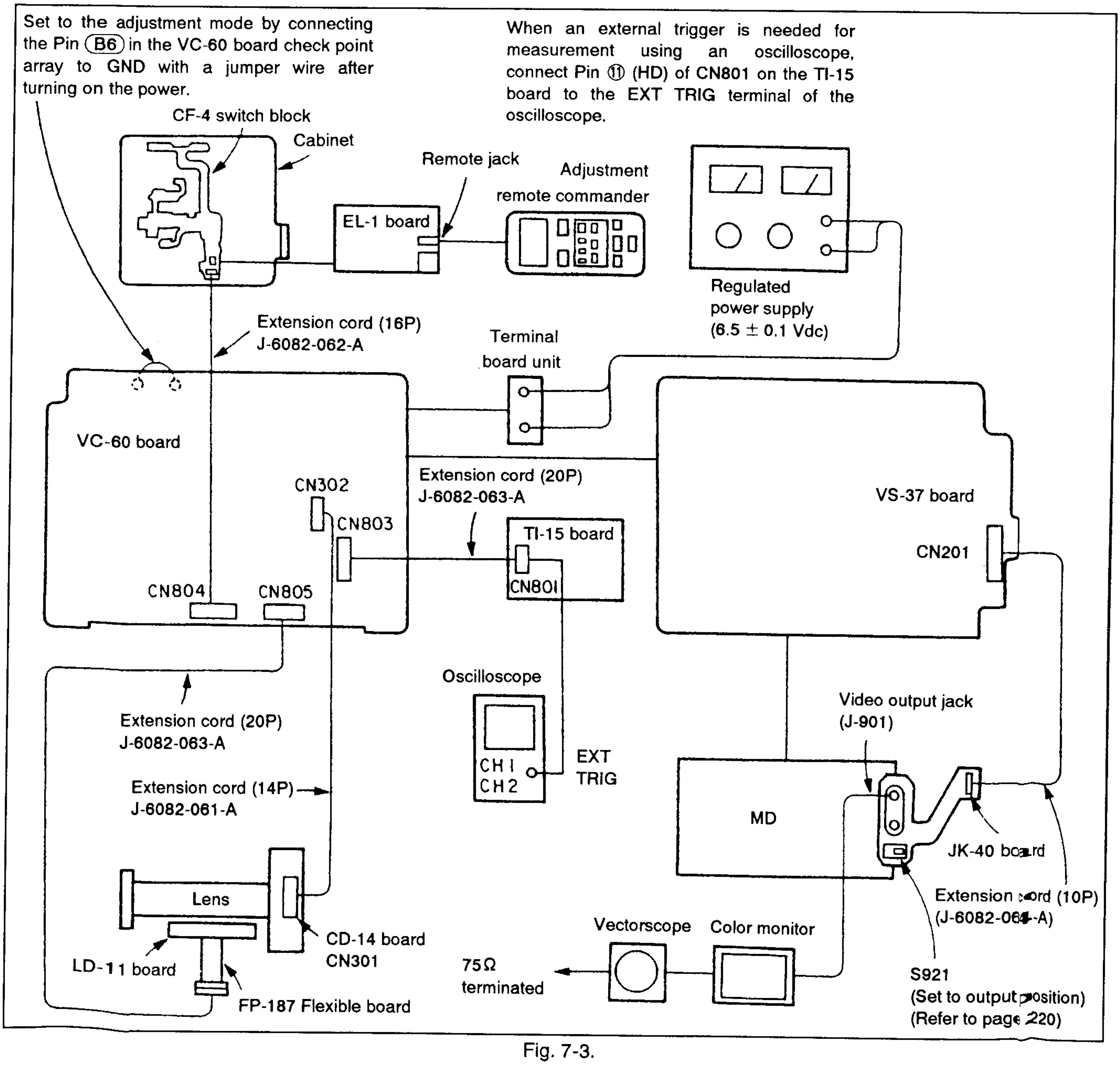

Set to the adjustment mode by connecting the Pin (B6) in the VC-60 board check point array to GND with a jumper wire after turning on the power.
When an external trigger is needed for measurement using an oscilloscope, connect Pin ⑪ (HD) of CN801 on the TI-15 board to the EXT TRIG terminal of the oscilloscope.
CF-4 switch block
Cabinet
EL-1 board
Remote jack
Adjustment remote commander
Regulated power supply (6.5 ± 0.1 Vdc)
Extension cord (16P) J-6082-062-A
Terminal board unit
VC-60 board
CN302
CN803
CN804
CN805
Extension cord (20P) J-6082-063-A
TI-15 board
CN801
VS-37 board
CN201
Extension cord (20P) J-6082-063-A
Extension cord (14P) J-6082-061-A
Oscilloscope
CH1
CH2
EXT TRIG
Video output jack (J-901)
MD
JK-40 board
Extension cord (10P) (J-6082-064-A)
Lens
LD-11 board
FP-187 Flexible board
CD-14 board CN301
Vectorscope
Color monitor
75Ω terminated
S921
(Set to output position)
(Refer to page 220)

Fig. 7-3.

7-1-3. Precautions

1) Setting of Switches

Unless specified otherwise, the switches are set to the following positions and adjustment is made without a cassette inserted.

1. Camera/video power switch (S901 on FK-9 board) ......camera
2. Standby switch (S909 on FK-9 board) ......standby
3. Auto-lock switch (S765 on CF-4 board) ......OFF
4. White balance button (S757 on CF-4 board) ...... ☼ (indoors white balance mode)
5. Shutter speed button (S760 on CF-4 board) ......normal (1/50)
6. Input/output select switch (S921 on JK-40 board) ......output (Refer to page 220)

2) Adjustment Order

As a rule, the adjustments are performed in the listed order.

3) Subjects

1. Color bar chart (standard picture frame)
   When performing adjustment using the color bar chart, adjust the picture frame shown in Fig. 7-4. (standard picture frame).
2. White pattern (standard picture frame)
   Remove the color bar chart from the pattern box and use the zoom lever so that the white pattern has the same size and is in the same position as the color bar chart (standard picture frame).

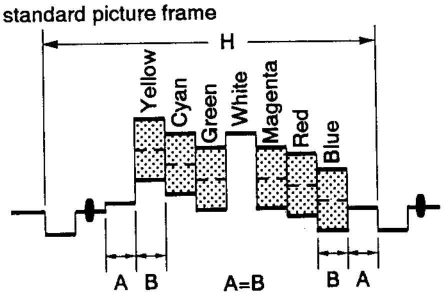

Color bar chart standard picture frame
H
Yellow
Cyan
Green
White
Magenta
Red
Blue
A B
A=B
B A

Fig. a (Video input/output terminal output waveform)

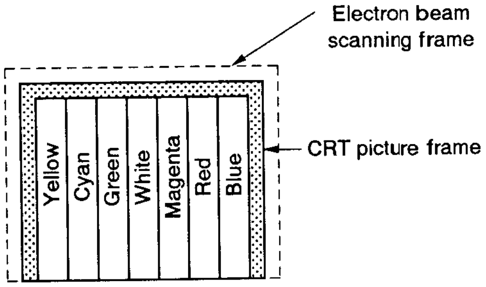

Electron beam scanning frame
CRT picture frame
Yellow
Cyan
Green
White
Magenta
Red
Blue

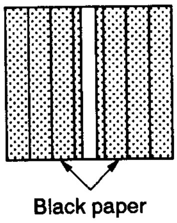
Fig. b (Picture on monitor TV)

Adjust the zooming and direction of the camera to obtain the output waveform shown in Fig. a and the monitor TV picture shown in Fig. b.

Fig. 7-4.

3. All white pattern
   Remove the color bar chart from the pattern box and set the zoom lever fully to the TELE (66 mm) side.
4. High luminance pattern
   Create the high luminance pattern as shown in Fig. 7-5., and adjust for the picture frame shown in Fig. 7-6.
5. Siemens star (J-6080-875-A)
   Adjust the direction of the camera so that center of the Siemens star is lined up with the center of the monitor screen on the monitor TV screen.

High luminance pattern


Black paper

Attach black paper over all sections of the pattern except for half of the white bar of the color bar chartt. Display the picture on the monitor with the standard picture frame.

Fig. 7-5.

High luminance pattern

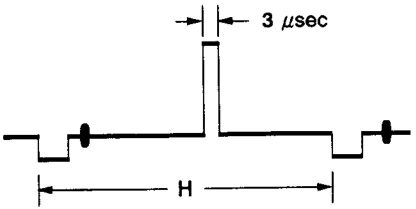


Fig. a (Video input/output terminal output waveform)

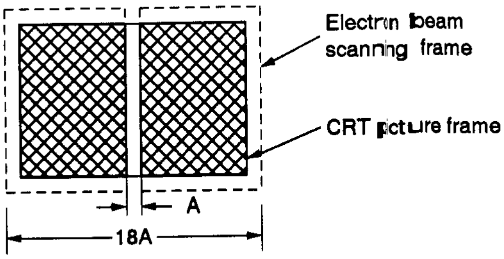

Electron beam scanning frame
CRT picture frame
A
18A

Fig. b (Picture on monitor TV)

Adjust the zooming and direction of the camera to obtain the output waveform shown in Fig. a and the monitor TV picture shown in Fig. b.

Fig. 7-6.

7-1-4. Adjustment Remote Controller

An EVR (electronic variable resistor) is used as the adjustment element for the camera block, replacing the conventional semi-fixed resistor. The EVR is controlled by the EVR/AWB microprocessor (IC361 on VC-60 board). This microprocessor reads the data written in the nonvolatile memory of the microprocessor and sends it to the EVR. The EVR D-A converts this data (8 bits for each adjustment point) and creates the adjustment voltage.

Thus, it is necessary to change the adjustment data contained in the nonvolatile memory when adjusting the camera block, and the adjustment memory is used for this purpose.

The adjustment remote controller performs bidirectional communications with the camera block microprocessor using the remote control signal lines (LANC). Adjustment addresses and adjustment data increment/decrement commands are sent to the camera block microprocessor from the adjustment remote controller. Adjustment addresses and adjustment data are sent from the camera block microprocessor to the adjustment remote controller.

1. Use of adjustment remote controller

Solder the lead wire to Pin (B6) (refer to 7-1-5) of the check point array on the VC-60 board.

1) Connect the adjustment remote controller to the remote terminal (J902 on EL-1 board). (Set the HOLD switch of the adjustment remote controller to the HOLD position (SERVICE position).)
2) Turn on the power of the main unit.
3) Connect Pin (B6) ($\overline{\text{CAM ADJ}}$) of the check point array to GND using a jumper wire.
   (This connection causes the EVR/AWB microprocessor to cease normal remote control operation and to begin adjustment dedicated communications.)
   Note: Be sure to make this connection only after turning on the power. The following will be displayed on the LCD of the adjustment remote controller if the connection is normal. (Adjustment data varies according to the unit.)

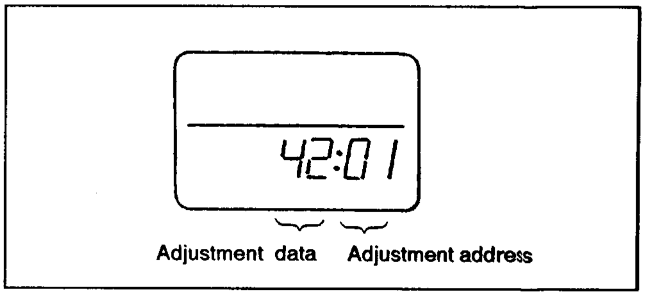


Fig. 7-7.

4) Designate the desired adjustment address using the adjustment remote controller. The adjustment address is incremented by pressing the FF (►►) button and decremented by pressing the REW (◄◄) button. (The adjustment address is indicated in decimal, and there are 89 addresses from 01 to 89. The adjustment address corresponds to the EVR (IC252, IC302, IC611 on VC-60 board) output terminals. Refer to Table 7-3. for the adjustment contents of the various addresses.)

5) Perform adjustment by incrementing or decrementing the adjustment data.
The adjustment data is incremented by pressing the PLAY (►) button. The adjustment data is decremented by pressing the STOP (■) button.
- The adjustment address is indicated in hexadecimal. There are 256 values from 00 to FF.

Hexadecimal	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Indication on LCD	0	1	2	3	4	5	6	7	8	9	A	b	c	d	E	F
Decimal equivalent	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Table 7-1.

- The adjustment data corresponds to the EVR (IC252, IC302, IC611 on VC-60 board) output voltage, and is as follows.

Adjustment data ( ) is decimal equivalent	EVR output voltage
FF (=255)	Maximum value (approx. 5 Vdc)
↑ F0 (=240)	↑
E0 (=224)	
D0 (=208)	
C0 (=192)	
B0 (=176)	
A0 (=160)	
90 (=144)	
80 (=128)	Center value (approx. 2.5 Vdc)
70 (=112)	
60 (=96)	
50 (=80)	
40 (=64)	
30 (=48)	
20 (=32)	
↓ 10 (=16)	↓
00 (=0)	Minimum value (approx. 0 Vdc)

Table 7-2.

6) The adjustment address is changed using the FF (►►) button or REW (◄◄) button to store the adjustment data in the nonvolatile memory of EVR/AWB microprocessor (IC361 on VC-60 board).
(The new adjustment data is not stored in the nonvolatile memory unless this operation is performed.)

2. Precautions on use of adjustment remote controller

It is possible to accidentally erase correct adjustment data due to an error in operation of the adjustment remote controller. In order to prevent this, we recommend that you make a note of all adjustment data before adjustment and record the new adjustment data after completing each adjustment item.

3. Adjustment address table

Adjustment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Adjustment Data Memo Column
01	Pin ⑱ of IC252	DELTA R	Auto white balance adjustment	
02	Pin ⑲ of IC252	DELTA B		
03	Pin ② of IC252	TITLE PEDESTAL		
04	Pin ③ of IC252	C-PED	Fixed at "A0"	A0
05	Pin ④ of IC252	R-Y GAIN	Color reproduction (gain) adjustment	
06	Pin ⑤ of IC252	B-Y GAIN		
07	Pin ⑥ of IC252	R-Y HUE	Color reproduction (hue) adjustment	
08	Pin ⑦ of IC252	B-Y HUE		
09	Pin ⑧ of IC252	C LEVEL		
10	Pin ⑨ of IC252	TITLE Y		
11	Pin ⑫ of IC252	R GAIN	Indoor white balance adjustment	
12	Pin ⑬ of IC252	B GAIN		
13	Pin ⑱ of IC302	C1 GAIN	Chroma matrix adjustment	
14	Pin ⑲ of IC302	Y1 GAIN	Y matrix adjustment	
15	Pin ② of IC302	TITLE A/D		
16	Pin ③ of IC302	BURST LEVEL		
17	Pin ④ of IC302	HUE CONT		
18	Pin ⑤ of IC302	SYNC LEVEL		
19	Pin ⑥ of IC302	SET UP		
20	Pin ⑦ of IC302	WHITE CLIP	White clip adjustment	
21	Pin ⑧ of IC302	Y LEVEL		
22	Pin ⑨ of IC302	APERTURE	Aperture adjustment	
23	Pin ⑫ of IC302	YH GAIN	YH level adjustment	
24	Pin ⑬ of IC302	C2 GAIN	Chroma matrix adjustment	
25	Pin ⑱ of IC611	IRIS		
26	Pin ⑲ of IC611	FOCUS SPEED		
27	Pin ② of IC611	HALL OFFSET		
28	Pin ③ of IC611	MAX GAIN		
29	Pin ④ of IC611	AGC		
30	Pin ⑤ of IC611	V SUB		
31		———		
32		———		
33		———		–
34		———		–
35		———		–
36		———		–

Table 7-3. (1)

<table>
<tr><th>Adjustment Address</th><th>Adjustment Voltage Output Terminal</th><th>Adjustment Item</th><th>Remarks</th><th>Adjustment Data Memo Column</th></tr>
<tr><td>37</td><td></td><td>MODE</td><td>The following adjustment modes are selected by changing the adjustment data.
<table>
<tr><th>Adjustment data</th><th>Adjustment mode</th></tr>
<tr><td>00</td><td>Release</td></tr>
<tr><td>01</td><td>Focus hunching</td></tr>
<tr><td>03</td><td>Zoom position</td></tr>
<tr><td>05</td><td>Hall, iris close</td></tr>
<tr><td>07</td><td>Hall, iris open</td></tr>
<tr><td>09</td><td>Hall in/out threshold</td></tr>
<tr><td>0B</td><td>Auto-focus LLA</td></tr>
<tr><td>FD</td><td>Auto-focus filter fixed at FA</td></tr>
<tr><td>FF</td><td>Auto-focus filter fixed at FH</td></tr>
</table></td><td>00</td></tr>
<tr><td>38</td><td></td><td>LLA</td><td>Auto-focus LLA adjustment</td><td></td></tr>
<tr><td>39</td><td></td><td>MACRO</td><td></td><td></td></tr>
<tr><td>40</td><td></td><td>IN/OUT DOOR</td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>41</td><td></td><td>LOW CONT</td><td>Fixed at 03</td><td>03</td></tr>
<tr><td>42</td><td></td><td>BASE H</td><td>Auto-focus adjustment</td><td></td></tr>
<tr><td>43</td><td></td><td>THR UP</td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>44</td><td></td><td>STEP</td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>45</td><td></td><td>Hysteresis</td><td></td><td></td></tr>
<tr><td>46</td><td></td><td>HALL LEVEL</td><td></td><td></td></tr>
<tr><td>47</td><td></td><td>HANT LIMIT</td><td>Fixed at 02</td><td>02</td></tr>
<tr><td>48</td><td></td><td>FA BASE</td><td>Fixed at 28</td><td>28</td></tr>
<tr><td>49</td><td></td><td>INCLINE</td><td>Fixed at 06</td><td>06</td></tr>
<tr><td>50</td><td></td><td>TOPCHECK-THR</td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>51</td><td></td><td>BACK RUSH</td><td>Fixed at 02</td><td>02</td></tr>
<tr><td>52</td><td></td><td>TOP CHECK SEARCH</td><td>Fixed at 02</td><td>02</td></tr>
<tr><td>53</td><td></td><td>TOP LIMIT</td><td>Fixed at 05</td><td>05</td></tr>
<tr><td>54</td><td></td><td>FOCUS FG</td><td>Fixed at 01</td><td>01</td></tr>
<tr><td>55</td><td></td><td>TOP CHECK COUNTER</td><td>Fixed at 02</td><td>02</td></tr>
<tr><td>56</td><td></td><td>MODE1 THR</td><td>Fixed at 04</td><td>04</td></tr>
<tr><td>57, 58</td><td></td><td>————</td><td>Not used</td><td>—</td></tr>
<tr><td>59</td><td></td><td>START R</td><td>Preset R CONT data for reset start</td><td>30</td></tr>
<tr><td>60</td><td></td><td>START B</td><td>Preset B CONT data for reset start</td><td>41</td></tr>
<tr><td>61</td><td></td><td>BTM SLP R</td><td>Fixed at 22</td><td>22</td></tr>
<tr><td>62</td><td></td><td>BTM SLP B</td><td>Fixed at 10</td><td>10</td></tr>
<tr><td>63</td><td></td><td>MDL SLP R</td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>64</td><td></td><td>MDL SLP B</td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>65</td><td></td><td>TOP SLP R</td><td rowspan="2">Auto white balance adjustment</td><td></td></tr>
<tr><td>66</td><td></td><td>TOP SLP B</td><td></td></tr>
<tr><td>67</td><td></td><td>KEIKO R</td><td>Fixed at 10</td><td>10</td></tr>
<tr><td>68</td><td></td><td>KEIKO B</td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>69</td><td></td><td>BTM UP</td><td>Fixed at 89</td><td>89</td></tr>
<tr><td>70</td><td></td><td>BTM DWN</td><td>Fixed at 61</td><td>61</td></tr>
</table>

Table 7-3. (2)

<table>
<tr><th>Adjustment Address</th><th>Adjustment Voltage Output Terminal</th><th>Adjustment Item</th><th>Remarks</th><th>Adjustment Data Memo Column</th></tr>
<tr><td>71</td><td></td><td>MDL UP</td><td>Fixed at 7C</td><td>7C</td></tr>
<tr><td>72</td><td></td><td>MDL DWN</td><td>Fixed at 6A</td><td>6A</td></tr>
<tr><td>73</td><td></td><td>TOP UP</td><td rowspan="2">Auto white balance adjustment</td><td></td></tr>
<tr><td>74</td><td></td><td>TOP DWN</td><td></td></tr>
<tr><td>75</td><td></td><td>KEIKO DWN</td><td>Fixed at 8C</td><td>8C</td></tr>
<tr><td>76</td><td></td><td>R DWN LMT</td><td>Fixed at 1E</td><td>1E</td></tr>
<tr><td>77</td><td></td><td>B UP LMT</td><td rowspan="5">Auto white balance adjustment</td><td></td></tr>
<tr><td>78</td><td></td><td>R OUT LMT</td><td></td></tr>
<tr><td>79</td><td></td><td>B OUT LMT</td><td></td></tr>
<tr><td>80</td><td></td><td>R OUTDOOR</td><td></td></tr>
<tr><td>81</td><td></td><td>B OUTDOOR</td><td></td></tr>
<tr><td>82</td><td></td><td>BM DIV</td><td>Fixed at 23</td><td>23</td></tr>
<tr><td>83</td><td></td><td>D TM</td><td>Auto white balance tracking speed. Fixed at 10</td><td>10</td></tr>
<tr><td>84</td><td></td><td>F TM</td><td>Fixed at 20</td><td>20</td></tr>
<tr><td>85</td><td></td><td>CAM DDS 0</td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>86</td><td></td><td></td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>87</td><td></td><td></td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>88</td><td></td><td>CAM ALN</td><td>Fixed at 00</td><td>00</td></tr>
<tr><td>89</td><td></td><td>AWB mode</td><td>The following auto white balance adjustment modes are selected by changing the adjustment data.
<table>
<tr><th>Adjustment data</th><th>Adjustment mode</th></tr>
<tr><td>00</td><td>Release</td></tr>
<tr><td>10</td><td>White balance value output (within tracking zone)</td></tr>
<tr><td>E0</td><td>Auto white balance adjustment possible</td></tr>
<tr><td>F0</td><td>Auto white balance tracking zone evaluation invalid</td></tr>
</table></td><td>00</td></tr>
</table>

Table 7-3. (3)

7-1-5. Check Point Array

Almost all of the measurement points for camera block adjustment are located in the check point array on the VC-60 board. Solder short lead wires onto the terminals needed for adjustment and connect an oscilloscope, etc.

The terminal numbers and signal names for the check point array are shown in Table 7-4.

Terminal No.	Signal Name	Terminal No.	Signal Name
A1	G OUT CHK	B1	ID (2)
A2	N.C	B2	N.C
A3	OFFSET MIX	B3	Y (LPF) OUT
A4	Y0	B4	V SUB CHK
A5	Y1	B5	AW ADJ
A6	C0	B6	$\overline{\text{CAM ADJ}}$
A7	C1	B7	OFFSET CONT
A8	CAM Y	B8	N.C
A9	YH (MIX OUT)	B9	SHUTTER EN
A10	CAM C	B10	GND
A11	N.C	B11	CCD OUT

Table 7-4.

* N.C......no connection

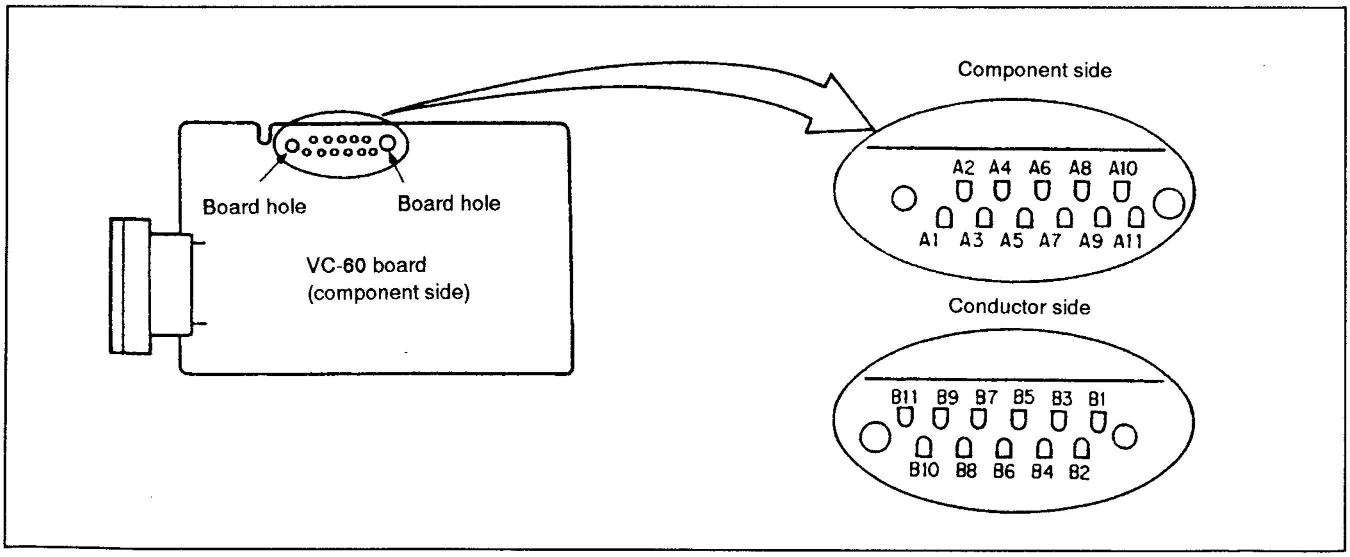

Component side
A2 A4 A6 A8 A10
A1 A3 A5 A7 A9 A11
Board hole
Board hole
VC-60 board
(component side)
Conductor side
B11 B9 B7 B5 B3 B1
B10 B8 B6 B4 B2

Fig. 7-8.

7-1-6. AF Microprocessor Data Reading Jig

The AF microprocessor data reading jig converts the serial data (output data varies according to hall (iris) state, focus state, focus motor speed, zoom ring position, etc.) for adjustment output from the AF microprocessor (IC613 on VC-60 board) into a 2-digit hexadecimal code and displays it on the LED.

Connections:
Connect as shown in the diagram below.

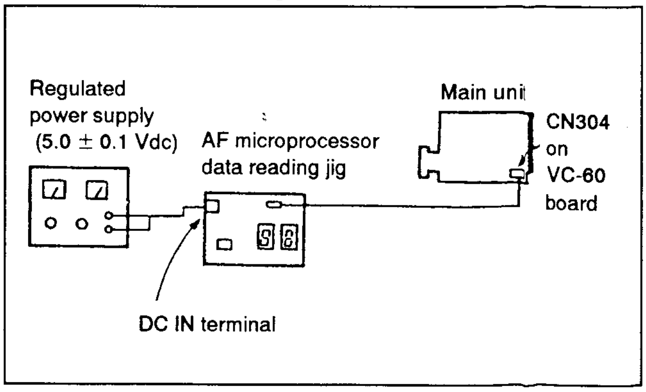

Regulated
power supply
(5.0 ± 0.1 Vdc)
AF microprocessor
data reading jig
Main unit
CN304
on
VC-60
board
DC IN terminal

Fig. 7-9.

7-1-7. Data Processing

For some of the adjustment items, calculation from the data (hexadecimal) indicated on the AF microprocessor data reading jig and adjustment remote controller is needed to obtain the adjustment data. In these cases, convert the hexadecimal values to decimal before calculation and reconvert the result to hexadecimal to obtain the adjustment data. A hexadecimal-decimal conversion table is shown in Table 7-5.

Hexadecimal-Decimal Conversion Table

Hexadecimal lower digit / Hexadecimal upper digit	0	1	2	3	4	5	6	7	8	9	A (A)	B (b)	C (c)	②↓ D (d)	E (E)	F (F)
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
5	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A(A)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
①→ B(b)	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
C(c)	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D(d)	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E(E)	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F(F)	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Note: ( ) is the indication on the jig or adjustment remote commander.

Example: The indication on the jig or adjustment remote commander is BD (b d).
As the upper digit is B (b) and the lower digit is D (d), a decimal value of 189 is obtained from the intersection of ① and ② in the above table.

Table 7-5.

7-2. CAMERA SYSTEM ADJUSTMENT

7-2-1. Flange Back Adjustment

Subject	Siemens star (2m directly in front of lens reference plane (CCD imager))
Measurement Point	Check with a monitor TV
Measuring Instrument	
Adjusting Element	Flange back adjusting pin
Tools	Phillips screwdriver, flat blade (–) screwdriver

Adjustment method:

1) Press the FOCUS switch (S759 on CF-4 board) to set to the MANUAL mode.
2) Position a Siemens star 2m directly in front of the lens reference plane (See Fig. 7-2.).
3) Orient the camera block to have the center of the Siemens star imaged on the monitor TV screen coincide with the monitor screen center.
4) Check to assure the smooth motion of the lens zoom lever to both its extreme WIDE position (11 mm) and TELE position (66 mm), and then set it at the extreme WIDE position. (In this process, also check the monitor image to assure proper zooming operation.)
5) Select adjustment address 37 with the adjustment remote controller and enter adjustment data of 07. (Iris open mode) At this time, adjust the illumination on the Siemens star or place an ND filter over the lens, and confirm that the proper image is displayed on the monitor TV screen.
6) Set the lens focusing mark at the center of "2".

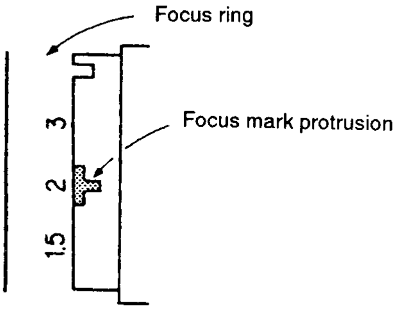


Fig. 7-10.

7) Loosen flange back setscrew ❶ with a Phillips screwdriver. (See Fig. 7-12.)
8) By turning the flange back adjusting pin ❷ while watching the monitor screen, attain the optimum definition of a wedge at the Siemens star center on the screen. (Turn it a few turns to the left and right to ensure optimum definition.)

   Note: Do not turn the adjusting pin excessively in either direction.
9) While holding the flange back adjusting pin ❷ to prevent further rotation, retighten the flange back setscrew ❶.
10) With the zoom lever fixed at its WIDE end, turn the focusing ring and set it to the position that provides the optimum definition image of the wedge. Check to assure the focusing mark protrusion position is within the range shown in Fig. 7-11. Also, rotate the focusing ring to the close (1.1m) and far (∞) extremes and confirm that the wedge is no longer in focus.

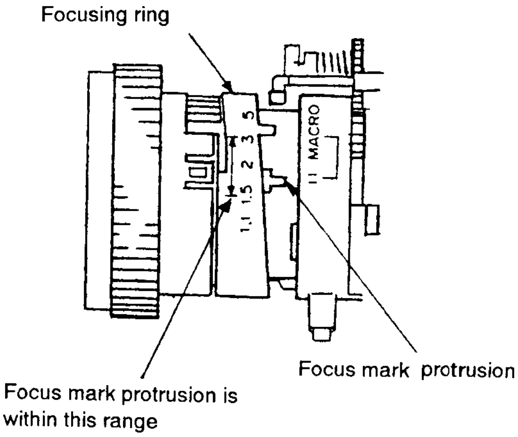


Fig. 7-11.

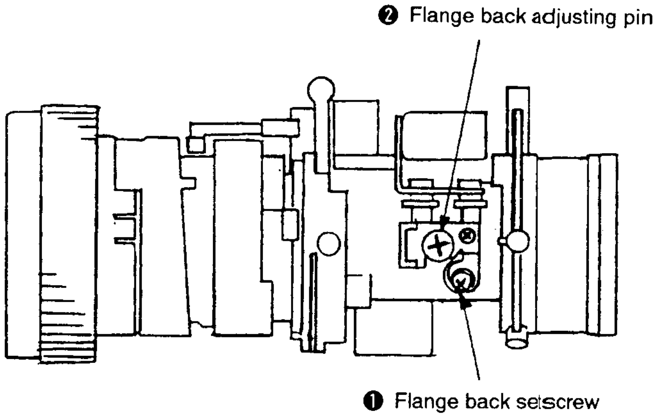


Fig. 7-12.

11) Fix the zoom lever at the extreme TELE position.
12) Turn the focusing ring and stop at the position where the wedge has optimum definition.

    Confirm that the focus mark is within ± 1.5 mm of "2".
13) Select adjustment address 37 with the adjustment remote controller and enter adjustment data of 00. (Iris normal)
14) Change the adjustment address to store the adjustment data in the memory.

7-2-2. Power Supply Check (VC-60 Board)

Measuring Instrument	Digital voltmeter
CAM 5V Check	
Measurement Point	Pin ④ of W801
Specified Value	$4.9^{+0.1}_{-0.07}$ Vdc
23V Check	
Measurement Point	Pin ① of W801
Specified Value	23.0 ± 1.5 Vdc
15V Check	
Measurement Point	Pin ② of W801
Specified Value	15.0 ± 0.45Vdc
− 9V Check	
Measurement Point	Pin ③ of W801
Specified Value	− 9.0 ± 0.5Vdc

Checking method:

1) Each power supply voltage should be at its specified level.

7-2-3. EVR Initial Settings

Set to the following initial settings of the adjustment data only when the EVR/AWB microprocessor (IC361 on VC-60 board) was replaced.

Adjustment Address	Adjustment Data Initial Value	Adjustment Address	Adjustment Data Initial Value	Adjustment Address	Adjustment Data Initial Value
01 (DELTA R)	50	44 (STEP)	00	68 (KEIKO B)	00
02 (DELTA B)	50	47 (HANT LIMIT)	02	69 (BTM UP)	89
04 (C-PED)	A0	48 (FA BASE)	28	70 (BTM DWN)	61
17 (HUE CONT)	B0	49 (INCLINE)	06	71 (MDL UP)	7C
18 (SYNC LEVEL)	A0	50 (TOP CHECK-THR)	00	72 (MDL DWN)	6A
19 (SET UP)	A7	51 (BACK RUSH)	02	75 (KEIKO DWN)	8C
20 (WC)	FF	52 (TOPCHECK-SEARCH)	02	76 (R DWN LMT)	1E
21 (Y LEVEL)	40	53 (TOP LIMIT)	05	78 (R OUT LMT)	2D
25(IRIS)	FF	54 (FOCUS FG)	01	82 (BMDIV)	23
28 (MAX GAIN)	B0	55 (TOP CHECK COUNTER)	02	83 (D TM)	10
29 (AGC)	FF	56 (MODE 1 THR)	04	84 (F TM)	20
30 (V SUB)	40	59 (START R)	30	85 (CAM DDS O)	00
38 (LLA)	3F	60 (START B)	41	86	00
39 (MACRO)	00	61 (BTM SLP R)	22	87	00
40 (IN/OUT DOOR)	00	62 (BTM SLP B)	10	88 (CAM ALN)	00
41 (LOW CONT)	03	63 (MDL SLP)	00	89 (AWB MODE)	00
42 (BASE H)	03	64 (MDL SLP B)	00		
43 (THR UP)	00	67 (KEIKO R)	10		

Table 7-6.

Adjustment method:

1) Set the RV701 (HALL ADJ) on the LD-11 board to the mechanical center.
2) Set the adjustment data at the various adjustment addresses to the initial values using the adjustment remote controller.
3) Change the adjustment address to store the last adjustment data in the memory.

7-2-4. V SUB Adjustment (VC-60 Board)

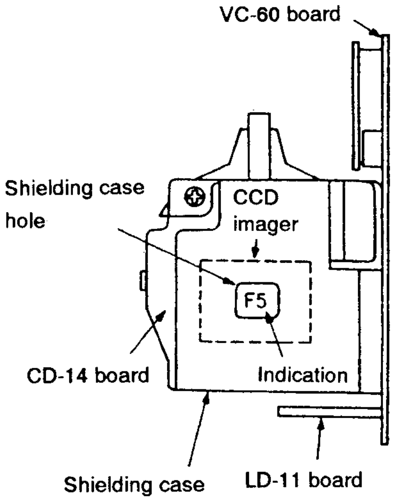
Subject	Not needed
Measurement Point	Pin (B4) (V SUB) of check point array
Measuring Instrument	Digital voltmeter
Adjustment Address	30 (V SUB)
Specified Value	(Voltage indicated by the imager) ± 0.05 Vdc

Adjustment method:
1) Set the adjustment address to 30 using the adjustment remote controller.
2) Change the adjustment data using the adjustment remote controller to set the VSUB voltage to (Voltage indicated by the imager) ± 0.05 Vdc.
3) Change the adjustment address to store the adjustment data in the memory.

Note: The VSUB specified voltage is expressed by two digits with the integer section abbreviation and decimal section by the imager.

Remove TI-15 board (CN803 on the VC-60 board) befor confirming the VSUB specified voltage.

Integer section abbreviation	Integer value
7	7
8	8
9	9
A	10
B	11
C	12
D	13
E	14
F	15
G	16
H	17
I	18
J	19



(Example)
If F5 is indicated, the integer value is F → 15 and decimal value is 5 → 0.5. Thus, the VSUB voltage is 15 + 0.5 = 15.5 (Vdc).

Fig. 7-13.

7-2-5. PLL Adjustment (VC-60 Board)

Subject	Not needed
Measurement Point	R152 side terminal of C152 or Pin ⑳ on the IC141
Measuring Instrument	Digital voltmeter
Adjustment Element	CT142
Specified Value	2.5 ± 0.2 Vdc

Adjustment method:
1) Adjust to 2.5 ± 0.2 Vdc with CT142.

7-2-6. Hall Adjustment (LD-11 Board)

Subject	All black (cover lens with black cap)
Measurement Point	CN304 on the VC-60 board
Measuring Instrument	AF microprocessor data reading jig
Adjusment Address	27 (Hall Offset)
Adjusting Element	RV701
Specified Value	When iris closed: Minimum value of 01 to 04 When iris open: 3D or 3E

Adjustment method:
1) Set the adjustment address to 37 with the adjustment remote controller, and set the adjustment data to 05. (Setting when iris closed)
2) Change the adjustment address to 27.
3) Change the adjustment data until the indication on the AF microprocessor data reading jig is the minimum value in the range of 01 to 04. (Hall offset adjustment)
4) Change the adjustment address to 37 and set the adjustment data to 07. (Setting when iris open)
5) Adjust RV701 until the indication on the AF microprocessor data reading jig is either 3D or 3E. (3D is indicated as 3d .)
6) Repeat steps 1) through 5) until the specified values are satisfied.
7) Set the adjustment address to 37 and set the adjustment data to 00. (Releases adjustment mode)
8) Change the adjustment address to store the adjustment data in the memory.

7-2-7. Iris Adjustment (VC-60 Board)

Subject	Color bar chart standard picture frame
Filter	ND filter 0.4 and 0.1
Measurement Point	Pin (B11) (CCD OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	25 (Iris)
Specified Value	360 ± 20 mVp-p

Adjustment method:

1) Set the adjustment address to 25 with the adjustment remote controller.
2) Without attaching an ND filter, change the adjustment data with the adjustment remote controller to set the IRIS OUT signal level to 360 ± 20 mVp-p.
3) Attach the ND filter 0.5 (0.4 + 0.1) to the front of the lens and confirm that there is a smooth change in the signal level.
4) Remove the ND filter and confirm that the signal level is 360 ± 20 mVp-p.
5) Repeat 2) through 4) if the specified value is not met.
6) Change the adjustment address to store the adjustment data in the memory.

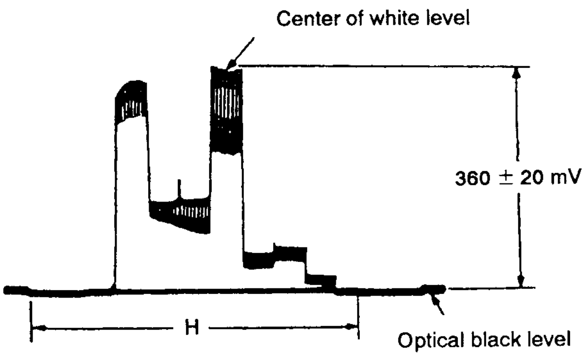


Fig. 7-14.

7-2-8. Iris In/Out Adjustment (VC-60 Board)

Subject	White pattern standard picture frame
Filter	ND filter 0.4 (two) and 0.1 (one)
Measurement Point	CN304
Measuring Instrument	AF microprocessor data reading jig
Adjustment Address	46 (hall level) 45 (hysteresis)

Adjustment method:

1) Cover the lens with the ND filter 0.8 (0.4+0.4).
2) Set the adjustment address to 37 with the adjustment remote controller and set the adjustment data to 09. (Hall in/out threshold mode setting)
3) Read the data indicated on the AF microprocessor data reading jig. This data will be a.
4) Change the adjustment address to 46 and enter a as the adjustment data.
5) Remove the ND filter 0.8 and replace it with ND filter 0.5 (0.4+0.1).
6) Read the data indicated on the AF microprocessor data reading jig. This data will be b.
7) Subtract data b from data a to obtain data c.
   (Refer to Table 7-5. Hexadecimal-Decimal Conversion Table)
   (Example)
   If a=1A and b=15, c=a–b =1A (26) – 15 (21) =05
   ( ) indicates decimal value
8) Obtain the hysteresis data from data c using the table below.

Data c	Hysteresis Data
02, 03	01
04, 05, 06	02
07, 08, 09	03

   (Example)
   The hysteresis data is 02 if c=05.
9) Change the adjustment address to 45 and enter the hysteresis data as the adjustment data.
10) Change the adjustment address to 37 and set the adjustment data to 00.
    (Releases hall in/out threshold mode)
11) Change the adjustment address to store the adjustment data in the memory.

7-2-9. AGC Adjustment (VC-60 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (B3) (Y (LPF) OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	29 (AGC)
Specified Value	160 ± 5 mVp-p

Adjustment method:

1) Set the adjustment address to 29 using the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the Y (LPF) signal level to 160 ± 5 mVp-p.
3) Change the adjustment address to store the adjustment data in the memory.

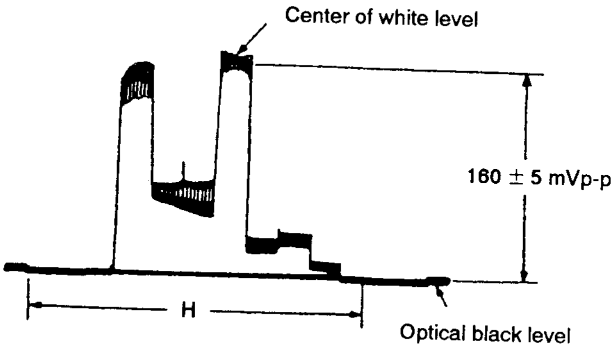


Fig. 7-15.

7-2-10. Y Signal Matrix Adjustment (VC-60 Board)

Subject	Color bar standard picture frame
Measurement Point	1: Pin (A4) (Y0) of check point array 2: Pin (A5) (Y1) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	14 (Y1 GAIN)
Specified Value	Y1 signal level=Y0 signal level

Adjustment method:

1) Connect the oscilloscope to Pin (A4) of the check point array and measure the Y0 signal level.
2) Connect the oscilloscope to Pin (A5) of the check point array.
3) Set the adjustment address to 14 using the adjustment remote controller.
4) Change the adjustment data until the Y1 signal level is the same as the Y0 signal level measured in 1).
5) Change the adjustment address to store the adjustment data in the memory.

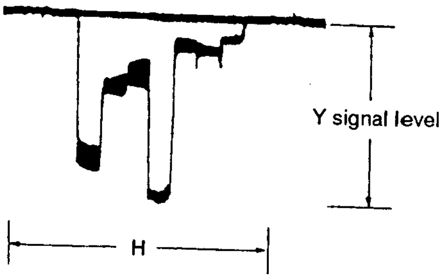


Fig. 7-16.

7-2-11. Chroma Signal Matrix Adjustment (1) (VC-60 Board)

Subject	Color bar standard picture frame
Measurement Point	1: Pin (A6) (C0) of check point array 2: Pin (A7) (C1) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	13 (C1 GAIN)
Specified Value	C1 signal level=C0 signal level

Adjustment method:

1) Connect the oscilloscope to Pin (A6) of the check point array and measure the C0 signal level. (The C0 signal level is the larger of the CR and CB signal levels.)
2) Connect the oscilloscope to Pin (A7) of the check point array.
3) Set the adjustment address to 13 using the adjustment remote controller.
4) Change the adjustment data until the C1 signal level is the same as the C0 signal level measured in 1).
5) Change the adjustment address to store the adjustment data in the memory.

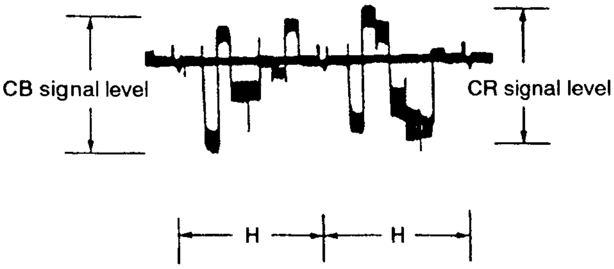


Fig. 7-17. C0 and C1 signal levels

7-2-12. Chroma Signal Matrix Adjustment (2) (VC-60 Board)

Subject	Color bar standard picture frame
Measurement Point	CH1 (X): emitter of Q257 (B-Y) CH2 (Y): emitter of Q255 (R-Y)
Measuring Instrument	Oscilloscope (X-Y mode)
Adjustment Address	24 (C2 GAIN)
Specified Value	Separate color luminance points become one.

Note: Adjustment can be made in the same manner using a vectorscope.
(Vectorscope connection terminal: video output terminal)

Adjustment method:

1) Set the adjustment address to 24 using the adjustment remote controller.
2) Change the adjustment data so that the two separate color luminance points become one respectively.
3) Change the adjustment address to store the adjustment data in the memory.

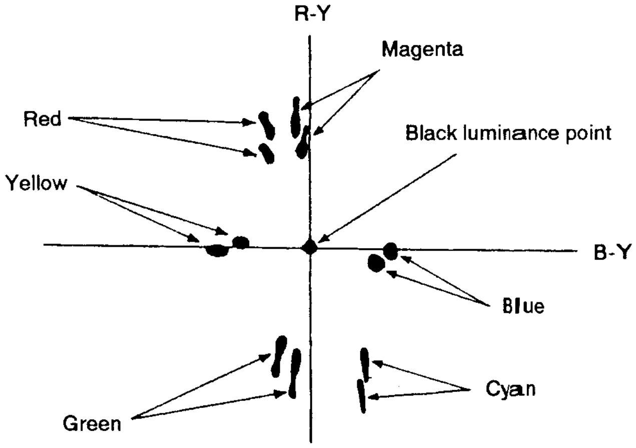


Fig. 7-18.

7-2-13. YH Level Adjustment (VC-60 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (A9) (YH) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	23 (YH LEVEL)
Specified Value	900 ± 40 mVp-p

Adjustment method:

1) Set the adjustment address to 23 with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the YH signal level to 900 ± 40 mVp-p.
3) Change the adjustment address to store the adjustment data in the memory.

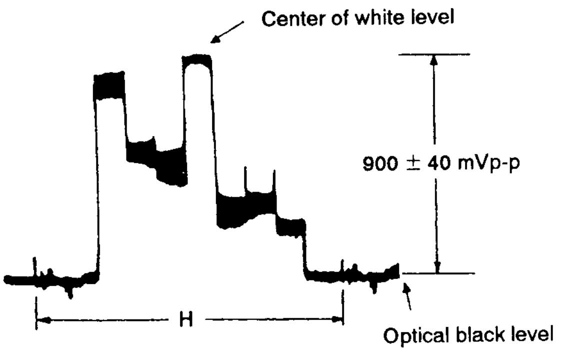


Fig. 7-19.

7-2-14. Sync Level Adjustment (VC-60 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin (A8) (CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	18 (SYNC LEVEL)
Specified Value	300 ± 5 mVp-p

Adjustment method:

1) Set the adjustment address to 18 with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the sync level to 300 ± 5 mVp-p.
3) Change the adjustment address to store the adjustment data in the memory.

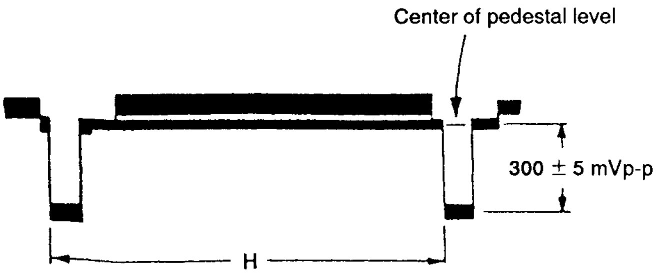


Fig. 7-20.

7-2-15. Setup Adjustment (VC-60 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin (A8) (CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	19 (SET UP)
Specified Value	30 ± 10 mV

Note: 1), 2) and 3) are steps taken to reduce noise.

Adjustment method:

1) Set the address to 22 (APERTURE) with the adjustment remote controller, and enter 00 as the adjustment data after making a note of the adjustment data for this address.
2) Set the address to 28 (MAX GAIN) with the adjustment remote controller, and enter 00 as the adjustment data after making a note of the adjustment data for this address.
3) Set the adjustment address to 21 (Y LEVEL) with the adjustment remote controller, and enter 90 as the adjustment data after making a note of the adjustment data for this address.
4) Set the adjustmenyt address to 19 with the adjustment remote controller.
5) Change the adjustment data with the adjustment remote controller to set the setup level to 30 ± 10 mV.
6) Set the adjustment address to 22 and enter the adjustment data recorded in 1).
7) Set the adjustment address to 28 and enter the adjustment data recorded in 2).
8) Set the adjustment address to 21 and enter the adjustment data recorded in 3).
9) Change the adjustment address to store the adjustment data in the memory.

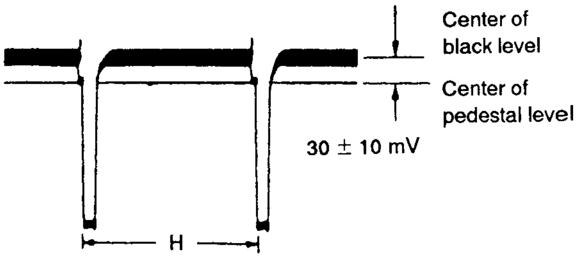


Fig. 7-21.

7-2-16. Y Level Adjustment (VC-60 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (A8) (CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	21(Y LEVEL)
Specified Value	630 ± 10 mV

Adjustment method:

1) Set the adjustment address to 20 with the adjustment remote controller, and make a note of the adjustment data for this address.
2) Set the adjustment data to FF with the adjustment remote controller.
3) Set the adjustment address to 21 with the adjustment remote controller.
4) Change the adjustment data with the adjustment remote controller to set the Y signal level to 630 ± 10 mV.
5) Set the adjustment address to 20 and enter the adjustment data recorded in 1).
6) Change the adjustment address to store the adjustment data in the memory.

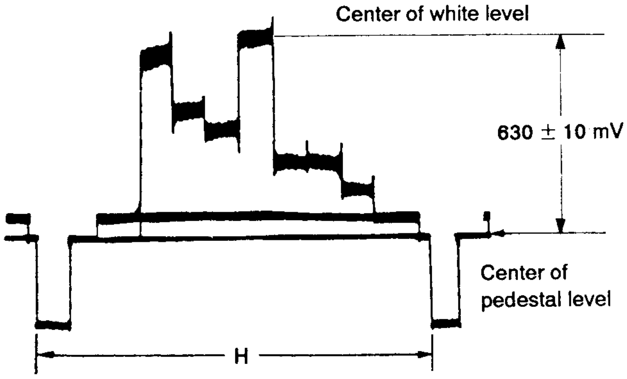


Fig. 7-22.

7-2-17. White Clip Adjustment (VC-60 Board)

Subject	High luminance pattern
Measurement Point	Pin (A8) (CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	20 (WHITE CLIP)
Specified Value	840 ± 20 mV

Adjustment method:

1) Set the adjustment address to 21 with the adjustment remote commander, and make a note of the adjustment data for this address.
2) Set the adjustment data to 40 with the adjustment remote commander.
3) Set the adjustment address to 20 with the adjustment remote controller.
4) Change the adjustment data with the adjustment remote controller to set the white clip level to 840 ± 20 mV.
5) Set the adjustment address to 21 and enter the adjustment data recorded in 1).
6) Change the adjustment address to store the adjustment data in the memory.

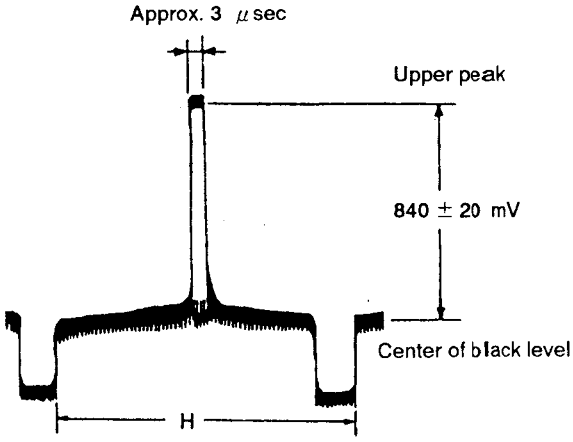


Fig. 7-23.

7-2-18. Aperture Adjustment (VC-60 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (A8) (CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	22 (APERTURE)
Specified Value	240 ± 10 mV

Adjustment method:

1) Set the adjustment address to 22 with the adjustment remote controller.
2) Focus the camera and set the aperture level (lower peak between green and white) to maximum.
3) Change the adjustment data to set the lower peak between green and white to 240 ± 10 mV above the pedestal level.
4) Change the adjustment address to store the adjustment data in the memory.

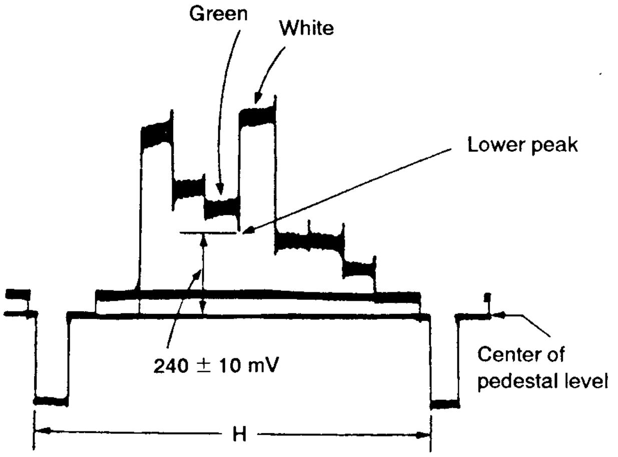


Fig. 7-24.

7-2-19. Max. Gain Adjustment (VC-60 Board)

Subject	Color bar chart standard picture frame
Filter	ND filters 1.0 (two) and 0.3 (one)
Measurement Point	Pin (A8) (CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	28 (MAX GAIN)
Specified Value	360 ± 10 mV

Adjustment method:

1) Cover the lens with the ND filter 2.3 (1.0 + 1.0 + 0.3).
2) Set the adjustment address to 28 with the adjustment remote controller.
3) Change the adjustment data with the adjustment remote controller to set the Y signal level to 360 ± 10 mV.
4) Change the adjustment address to store the adjustment data in the memory.

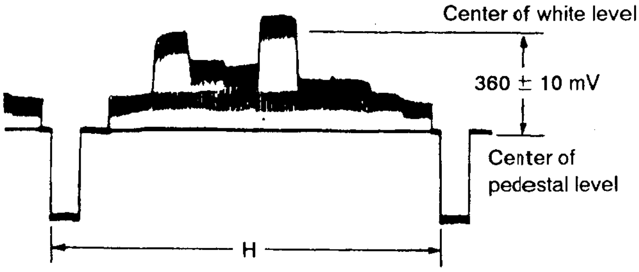


Fig. 7-25.

7-2-22. Burst Phase Adjustment (VC-60 Board) (Mothod Using Oscilloscope)

Subject	All black (cover lens with black cap)
Measurement Point	Video output terminal
Measuring Instrument	Oscilloscope (Trigger slope:+)
Adjustment Address	17 (HUE CONT)
Specified Value	Burst phase should become a single line.

Adjusing method:

1) Set adjustment address to 17 with the adjustment remote controller.
2) Change the adjustment data so as to turn the burst waveform into a single line.
3) Change the adjustment address to store the adjustment data in the memory.
4) Perform Burst Level Adjustment.

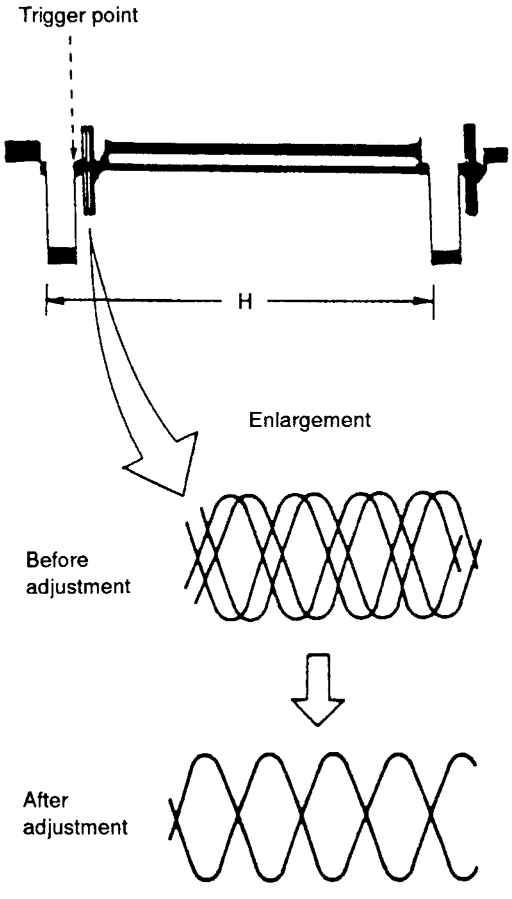


Fig. 7-28.

7-2-23. Burst Level Adjustment (VC-60 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin (A10) (CAM C) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	16 (BURST LEVEL)
Specified Value	200 ± 5 mVp-p

Adjustment method:

1) Set the adjustment address to 16 with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the burst level to 200 ± 5 mVp-p.
3) Change the adjustment address to store the adjustment data in the memory.

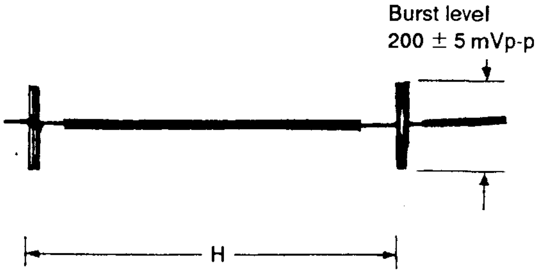


Fig. 7-29.

7-2-20. Chroma Level Adjustment (VC-60 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (A1) (G OUT CHK) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	09 (C LEVEL)
Specified Value	320 ± 20 mVp-p

Connections:

1) Connect Pin (B7) (OFFSET CONT) of the check point array to GND using a jumper wire.

Adjustment method:

1) Set the adjustment address to 09 with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the G OUT signal level to 320 ± 20 mVp-p.
3) Change the adjustment address to store the adjustment data in the memory.

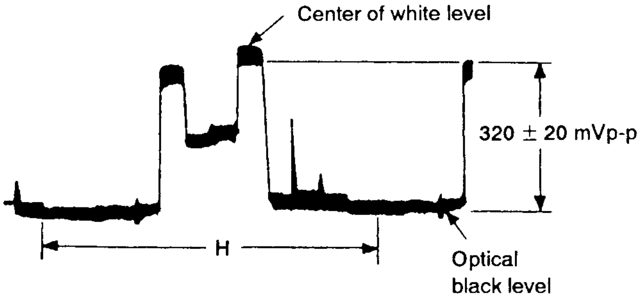


Fig. 7-26.

7-2-21. Burst Phase Adjustment (Method Using Vectorscope)

Subject	All black (cover lens with black cap)
Measurement Point	Video output terminal
Measuring Instrument	Vectrscope
Adjustment Address	17 (HUE CONT)
Specified Value	135° ± 1°

Adjustment method:

1) Set adjustment address to 17 with the adjustment remote controller.
2) Change adjustment data so as to set the burst luminance point in the 135° ± 1° position.
3) Change the adjustment address to store the adjustment data in the memory.
4) Perform Burst Level Adjustment.

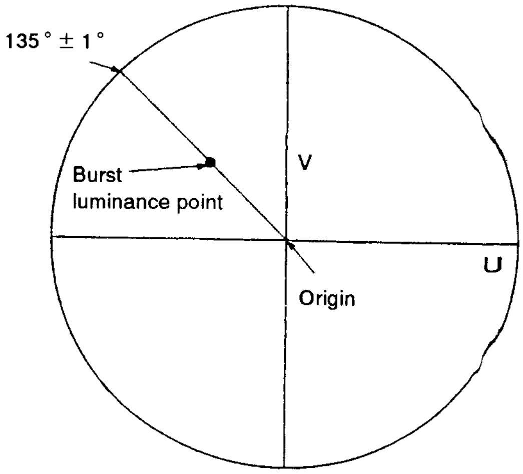


Fig. 7-27.

7-2-24. Indoor White Balance Adjustment (Method Using Vectorscope)

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Address	11 (R GAIN) 12 (B GAIN)
Specified Value	The center of the white luminance point is within a circle with a diameter of 1 mm centered around the origin.

Adjustment method:

1) Set the adjustment address to 11 with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to move the white luminance point to the origin point.
3) Set the adjustment address to 12.
4) Change the adjustment data to move the white luminance point to the origin point.
5) Repeat steps 1) through 4).
6) Change the adjustment address to store the adjustment data in the memory.

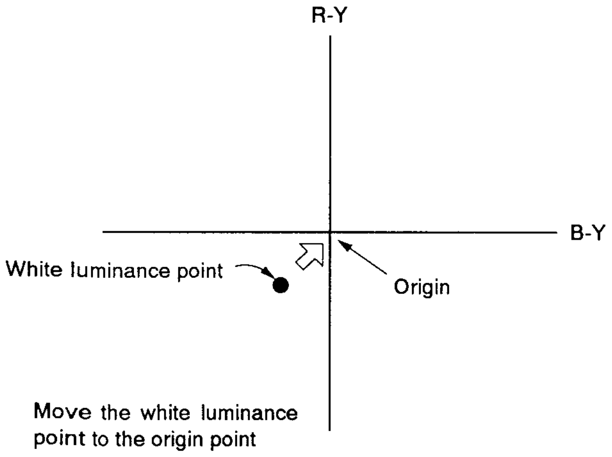

R-Y
B-Y
White luminance point
Origin
Move the white luminance point to the origin point

Fig. 7-30.

7-2-25. Indoor White Balance Adjustment (Method Using Oscilloscope) (VC-60 Board)

Subject	Color bar chart standard picture frame
Measurement Point	CH1 (X): emitter of Q257 (B-Y) CH2 (Y): emitter of Q255 (R-Y)
Measuring Instrument	Oscilloscope (X-Y mode)
Adjustment Address	11 (R GAIN) 12 (B GAIN)
Specified Value	Move the white luminance point to the black luminance point.

Adjustment method:

1) Set the adjustment address to 11 with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to move the white luminance point with the black luminance point.
3) Set the adjustment address to 12.
4) Change the adjustment data to move the white luminance point to the black luminance point.
5) Repeat steps 1) through 4).
6) Change the adjustment address to store the adjustment data in the memory.

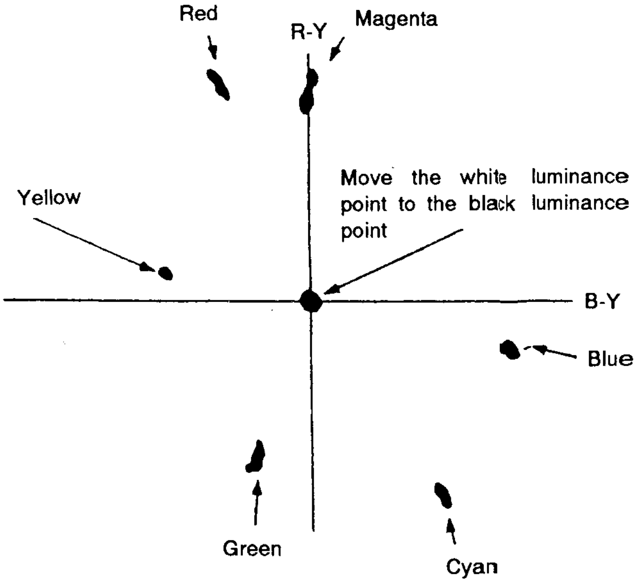

Red
R-Y
Magenta
Yellow
Move the white luminance point to the black luminance point
B-Y
Blue
Green
Cyan

Fig. 7-31.

7-2-26. Color Reproduction Adjustment (Method Using Vectorscope)

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Address	05 (R-Y GAIN) 06 (B-Y GAIN) 07 (B-Y HUE) 08 (R-Y HUE)
Specified Value	All color luminance points are within color reproduction frame.

Note: Confirm that Burst Level Adjustment and Indoor White Balance Adjustment have been completed.

Adjustment method:

1) Adjust the phase and gain of the vectorscope to set the burst luminance points to the designated position on the color reproduction frame.
2) Change the adjustment data at the various adjustment addresses using the adjustment remote controller until all color luminance points are within the color reproduction frame.
3) Change the adjustment address to store the adjustment data in the memory.

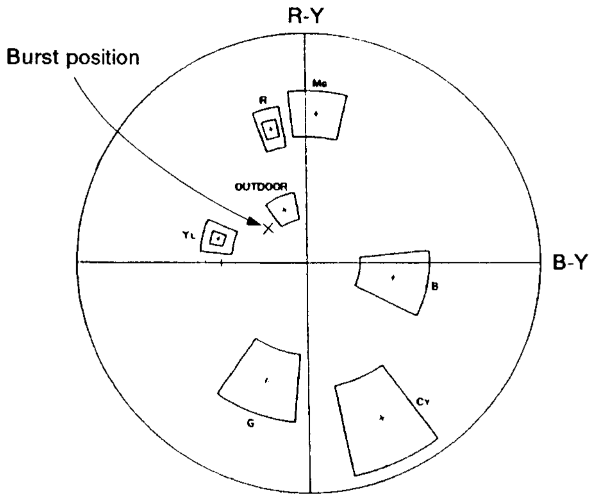


Fig. 7-32.

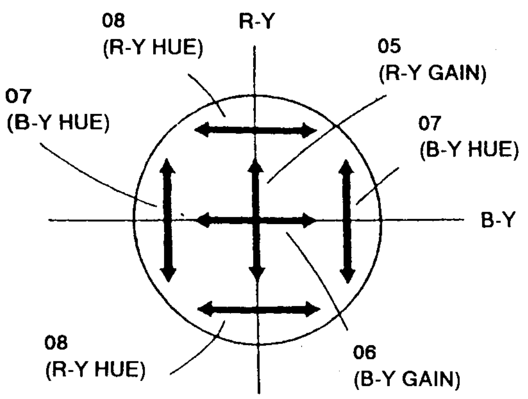


Fig. 7-33. Adjustment Address and Direction of Luminance Point Movement

7-2-27. Color Reproduction Adjustment (Method Using Oscilloscope)

1. Gain adjustment (VC-60 board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (A10) (CAM C) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	05 (R-Y GAIN) 06 (B-Y GAIN)
Specified Value	Red level: 345 ± 21 mVp-p Yellow level: 255 ± 16 mVp-p

Note: Confirm that Indoor White Balance Adjustment has been completed.

Adjustment method:

1) Set the adjustment address to 06 with the adjustment remote controller and set the adjustment data to B0.
2) Set the adjustment address to 07 and set the adjustment data to C0.
3) Set the adjustment address to 08 and set the adjustment data to C0.
4) Set the adjustment address to 05 and change the adjustment data to set the chroma signal red level to 345 ± 21 mVp-p.
5) Set the adjustment address to 06 and change the adjustment data to set the chroma signal yellow level to 255 ± 16 mVp-p.
6) Repeat steps 4) and 5).
7) Change the adjustment address to store the adjustment data in the memory.
8) Perform Hue Adjustment.

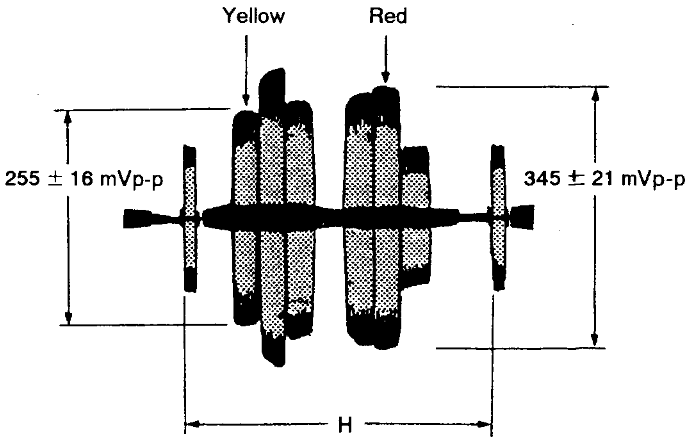


Fig. 7-34.

2. Hue adjustment (VC-60 board)

Subject	Color bar chart standard picture frame
Measurement Point	CH1 (X): emitter of Q257 (B-Y) CH2 (Y): emitter of Q255 (R-Y)
Measuring Instrument	Oscilloscope (X-Y mode)
Adjustment Address	07 (B-Y HUE) 08 (R-Y HUE)
Specified Value	Various color luminance points within color reproduction frame.

Note: Make sure that Indoor White Balance Adjustment has been completed.

Adjustment method:

1) Move the black luminance point on the oscilloscope to the origin point of the color reproduction frame.
2) Change the adjustment data at adjustment addresses 07 and 08 with the adjustment remote controller to bring the various color luminance points into the color reproduction frame.
3) Check the hue reproduced on the monitor TV and fine adjust the adjustment data at adjustment addresses 07 and 08 if necessary.
4) Change the adjustment address to store the adjustment data in the memory.

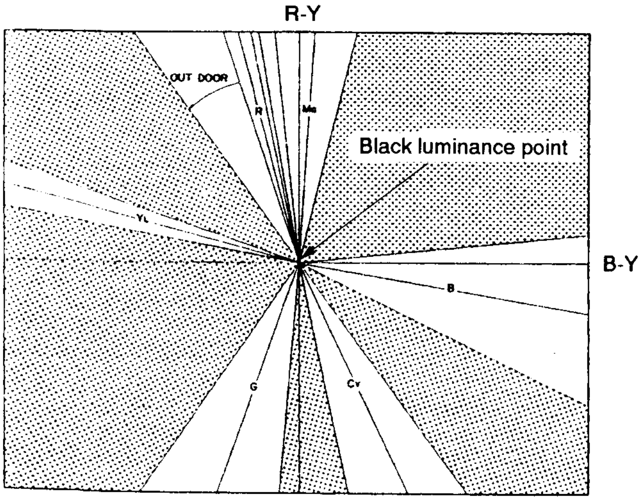


Fig. 7-35.

7-2-28. Auto White Balance Adjustment

Note: Be sure to first perform Preset Adjustment followed by Auto White Balance Adjustment.

1. Preset adjustment (VC-60 board)

Subject	White pattern standard picture frame

Note: 1) Perform preset adjustment after supplying power to the unit for at least 30 seconds.
2) When performing preset adjustment again, repeat after first turning the power off and then back on.

Preparations:

1) Prepare a 1 kΩ resistor for connecting Pin (B5) (AW ADJ) of the check point array and Pin ④ (CAM 5V) of W801.

Adjustment method:

1) Turn the power OFF and then ON.
2) Select adjustment address 89 (AWB MODE) and set the adjustment data to E0. Wait at least five seconds.
3) Change the adjustment address to store the adjustment data in the memory.
4) Remove the jumper wire between Pin (B6) (CAM ADJ) of the check point array and GND.
5) Connect Pin (B5) (AW ADJ) of the check point array and Pin ④ of W801 (CAM 5V)with a 1 kΩ resistor.
6) Connect Pin (B6) (CAM ADJ) of the check point array to GND using a jumper wire.
7) Confirm that the indication (adjustment address 01) of the adjustment remote controller is changed.
8) Remove the jumper wire connected to Pin (B6) (CAM ADJ) of the check point array after allowing one second or more to elapse.
9) Remove the 1 kΩ resistor connected to Pin (B5) (AW ADJ) of the check point array.
10) Connect Pin (B6) (CAM ADJ) of the check point array to GND using a jumper wire.

2. Auto white balance adjustment (VC-60 board)

Note: Be sure to perform this adjustment after completing Preset Adjustment.

Subject	White pattern standard picture frame
Filter	Filter C14 (C12+C2) for color temperature correction
Measuring Instrument	Oscilloscope (X-Y Mode)
Measurement Point	CH1 (X): emitter of Q257 (B-Y) CH2 (Y): emitter of Q255 (R-Y)
Adjustment Address	01 (DELTA R) 02 (DELTA B) 80 (R OUTDOOR) 81 (B OUTDOOR) 77 (B UP LIMIT) 78 (R OUT LIMIT) 79 (B OUT LIMIT) 65 (TOP SLP R) 66 (TOP SLP B) 73 (TOP UP) 74 (TOP DWN)
Specified Value	Line up the white luminance point with the black luminance point.

Note: 1) Make connection to the video output terminal when the vectorscope is used.
2) All calculations in this section are made in decimal.

Adjustment method:

1) Select adjustment address 89 (AWB MODE) with the adjustment remote controller and enter adjustment data of 10.
2) Change the adjustment data of adjustment addresses 01 and 02 with the adjustment remote controller to move the white luminance point to the black luminance point.
(Move the white luminance point to the origin point when using the vectorscope.)
The adjustment data of adjustment address 01 is D_1 and the adjustment data of adjustment address 02 is D_2.
3) Convert adjustment data D_1 to decimal to obtain D_1'.
Convert adjustment data D_2 to decimal to obtain D_2'.
(See Table 7-5. Hexadecimal-Decimal Conversion Table)
4) Obtain D_{80}' and D_{81}' by the following formulas.
$D_{80}'=D_1'+1$
$D_{81}'=D_2'+3$
5) Convert D_{80}' and D_{81}' to hexadecimal and call these values D_{80} and D_{81}.
6) Select adjustment address 80 with the adjustment remote controller and enter adjustment data D_{80}.
7) Select adjustment address 81 with the adjustment remote controller and enter adjustment data D_{81}.
8) Obtain D_{77}' by the following formula.
$D_{77}'=(D_2' \times 1.9)-43.2$
9) Convert D_{77}' to hexadecimal and call this value D_{77}.
(Round off the decimal portion)
10) Select adjustment address 77 with the adjustment remote controller and enter adjustment data D_{77}.
11) Select adjustment address 78 with the adjustment remote controller and enter adjustment data D_1.
12) Obtain D_{79}' by the following formula.
$D_{79}'=D_2'+10$
13) Convert D_{79}' to hexadecimal and call this value D_{79}.
14) Select adjustment address 79 with the adjustment remote controller and enter adjustment data D_{79}.
15) Obtain d' by the following formula.
$d'=(D_1' \times 5)+D_2'$
The adjustment procedure in 16) through 18) varies according to the value of d'.

[d' > 308]

16) Obtain D_{73}' and D_{74}' by the following formulas.
$D_{73}'=(D_1' \times 3)+(D_2' \div 2)+30$
$D_{74}'=D_{73}'-42$
17) Convert D_{73}' and D_{74}' to hexadecimal and call these values D_{73} and D_{74}.
(Round off the decimal portion)
18) Use the adjustment remote controller to enter the adjustment data shown in the table below for the indicated adjustment addresses.

Adjustment address	Adjustment data
65	20
66	01
73	D_{73}
74	D_{74}

Perform the adjustment steps beginning from 19).

[308 ≧ d' ≧ 286]

16) Obtain D_{73}' and D_{74}' by the following formulas.
$D_{73}'=(d' \div 2)+25$
$D_{74}'=D_{73}'-39$
17) Convert D_{73}' and D_{74}' to hexadecimal and call these values D_{73} and D_{74}.
(Round off the decimal portion)
18) Use the adjustment remote controller to enter the adjustment data shown in the table below for the indicated adjustment addresses.

Adjustment address	Adjustment data
65	41
66	01
73	D_{73}
74	D_{74}

Perform the adjustment steps beginning from 19).

[286 > d']

16) Obtain D_{73}' and D_{74}' by the following formulas.
    $D_{73}'=(D_1'\times 3)+D_2'+30$
    $D_{74}'=D_{73}'-42$
17) Convert D_{73}' and D_{74}' to hexadecimal and call these values D_{73} and D_{74}. (Round off the decimal portion)
18) Use the adjustment remote controller to enter the adjustment data shown in the table below for the indicated adjustment addresses.

Adjustment address	Adjustment data
65	20
66	00
73	D_{73}
74	D_{74}

19) Select adjustment address 89 and enter adjustment data 00.
20) Select adjustment address 89 and enter adjustment data F0.
21) Change the adjustment data of adjustment addresses 01 and 02 with the adjustment remote controller to move the white luminance point to the black luminance point.
    (Move the white luminance point to the origin point when using the vectorscope.)
22) Select adjustment address 89 and enter adjustment data of 00.
23) Change the adjustment address to store the adjustment data in the memory.

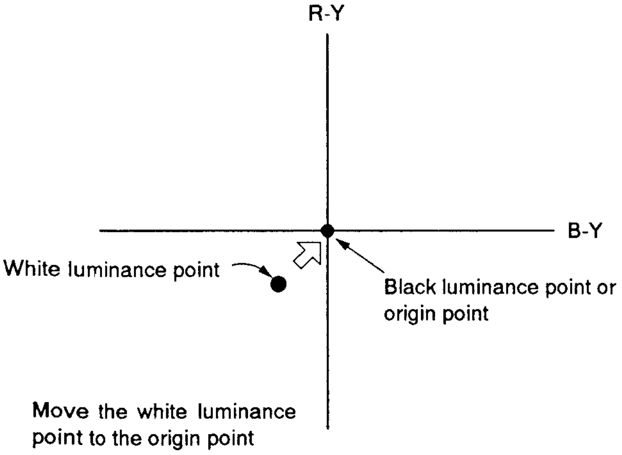

R-Y
B-Y
White luminance point
Black luminance point or origin point
Move the white luminance point to the origin point

Fig. 7-36.

(Example)

When the adjustment data obtained in Step 2) has the following values.

Adjustment address	Adjustment data
01	2A
02	53

→ Enter into adjustment address 78

D_1=2A and D_2=53 when there is conversion to decimal using Table 7-5.
$D_1'=42$
$D_2'=83$

In the same manner,
$D_{77}'=(83\times 1.9)-43.2=114.5$

Rounding off the decimal portion,
$D_{77}=73$ → Entered into adjustment address 77
Thus,
$D_{80}'=42+1=43$
$D_{81}'=83+3=86$
Converting to hexadecimal by Table. 7-5 results in,
D_{80}=2B → Entered into adjustment address 80
$D_{81}=56$ → Entered into adjustment address 81
$D_{79}'=(83+10)=93$
D_{79}=5D → Entered into adjustment address 79

In addition,
$d'=(42\times 5)+83=293$

Thus, $[308 \geqq d' \geqq 286]$
$D_{73}'=(293\div 2)+25=171.5$
∴ D_{73}=AC → Entered into adjustment address 73
$D_{74}'=171.5-39=132.5$
∴ $D_{74}=85$ → Entered into adjustment address 74

Also, adjustment data of 41 is entered into adjustment address 65, and adjustment data of 01 is entered into adjustment address 66.
The steps beginning from 19) are then performed.

7-2-29. Outdoor White Balance Confirmation (VC-60 Board)

Subject	White pattern standard picture frame
Measurement Point	When vectorscope used: video input/output terminals
Measuring Instrument	When oscilloscope used: CH1 (X): emitter of Q257 (B-Y) CH2 (Y): emitter of Q255 (R-Y)
Specified Value	See Fig. 7-37.

Connections:

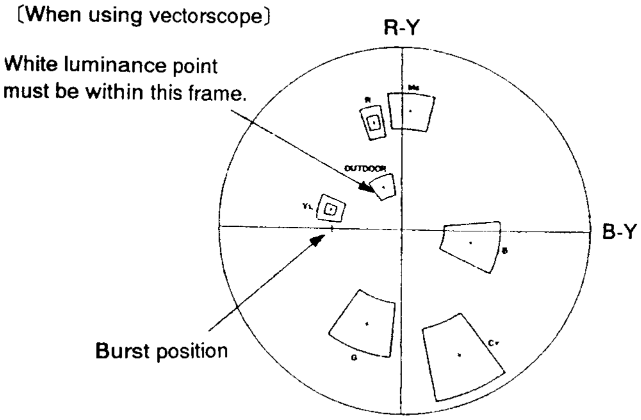
1) Remove the jumper wire connected to Pin (B6) (CAM ADJ) of the check point array. (Turns off the EVR adjustment mode)

Checking method:

1) Press the white balance button to select the outdoor white balance mode. (☀ mark is displayed on EVF screen.)
2) Confirm that the center of the white luminance point is within the OUTDOOR frame of the color reproduction frame.

Note: When using a vectorscope, adjust the GAIN and PHASE of the vectorscope so that burst luminance point move to the burst position of the color reproduction frame.

[When using vectorscope]



[When using oscilloscope]

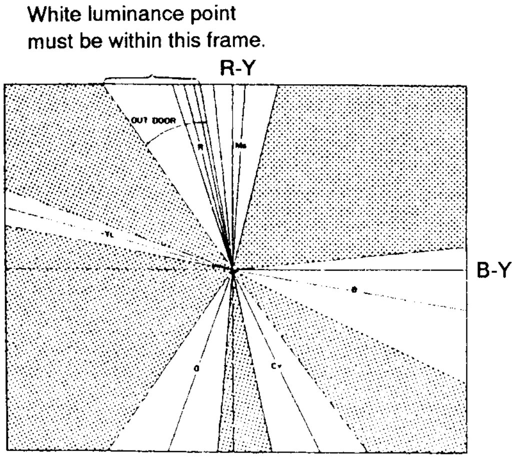


Fig. 7-37.

7-2-30. Focus Motor Speed Adjustment (VC-60 Board)

Subject	Arbitrary
Measurement Point	CN304
Measuring Instrument	AF microprocessor data reading jig
Adjustment Address	26 (FOCUS FG)
Specified Value	Average value of data indicated on jig=7.0 ± 0.5

Remarks: The rotation time from the close extreme to far extreme of the focus ring should be approximately 2.1 seconds after completion of adjustment.

Adjustment method:

1) Select adjustment address 37 with the adjustment remote controller and enter adjustment data of 01. (Sets hunching mode)
2) Set the adjustment address to 26.
3) Change the adjustment data so that the indication on the AF microprocessor data reading jig is 07 while the ring is rotating.
4) Press the HOLD button of the AF microprocessor data reading jig while the focus ring is rotating to read the indication value.
5) Repeat step 4) ten times and obtain the average value. Specified value=7.0 ± 0.5
   Repeat steps 3) and 4) if the specified value is not satisfied.
6) Set the adjustment address to 37 and set the adjustment data to 00. (Releases hunching mode)
7) Change the adjustment address to store the adjustment data in the memory.

7-2-31. Macro Area Adjustment (VC-60 Board)

Subject	Arbitrary
Measurement Point	CN304
Measuring Instrument	AF microprocessor data reading jig
Adjustment Address	39 (MACRO)
Specified Value	(Value at zoom ring WIDE position) -1

Adjustment method:

1) Set the zoom ring to the WIDE position (11 mm position).
2) Select adjustment address 37 with the adjustment remote controller and set the adjustment data to 03. (Sets zoom position indication mode)
3) Read the data indicated on the AF microprocessor data reading jig. (Data in the range of 06 to 0E is displayed if normal.)
4) Change the adjustment address to 39.
5) Subtract 1 from the data read from the jig and enter as the adjustment data. (See Table 7-5. Hexadecimal-Decimal Conversion Table)
6) Change the adjustment address to 37 and set the adjustment data to 00. (Releases zoom position indication mode)
7) Change the adjustment address to store the adjustment data in the memory.

7-2-32. Auto-Focus LLA Adjustment (VC-60 Board)

Subject	All black (cover lens with black cap)
Measurement Point	CN304
Measuring Instrument	AF microprocessor data reading jig
Adjustment Address	38 (LLA)
Specified Value	(Value indicated on jig) –2

Adjustment method:

1) Select adjustment address 37 with the adjustment remote controller and set to 0B as the adjustment data. (Sets auto-focus LLA adjustment mode)
2) Read the data indicated on the AF microprocessor data reading jig and call this value D.
3) Subtract 2 from D and make this value the LLA data.
(See Table 7-5. Hexadecimal-Decimal Conversion Table)

> (Example)
> When D=30 (48), LLA data is 2E (46)
> When D=31 (49), LLA data is 2F (47)
> ( ) is decimal equivalent

4) Select adjustment address 38 with the adjustment remote controller and enter the LLA data as the adjustment data.
5) Select adjustment address 37 and set 00 as the adjustment data. (Releases auto-focus LLA adjustment mode)
6) Change the adjustment address to store the adjustment data in the memory.

7-2-33. Auto-Focus Adjustment

Subject	All black (cover lens with black cap)
Measurement Point	CN304
Measuring Instrument	AF microprocessor data reading jig
Adjustment Address	42 (BASE-H)

Adjustment method:

1) Turn off the auto-focus with the FOCUS button (S759 on CF-4 board).
2) Select adjustment address 37 with the adjustment remote controller and enter adjustment data of FF.
3) Read the indication on the AF microprocessor data reading jig and call this value D.
4) Obtain adjustment data D_{42} according to the following formulas.
When D=0
D_{42}=03
When D > 0
D_{42}=D+2 * Hexadecimal calculations
5) Select adjustment address 42 with the adjustment remote controller and enter D_{42} as the adjustment data.
6) Select adjustment address 37 and enter adjustment data of 00.
7) Change the adjustment address to store the adjustment data in the memory.

7-2-34. Auto-Focus Confirmation

Subject	Siemens star (position 1.5m from the front of the lens reference plane (CCD imager)

Note: Perform adjustment with the EVF (electronic viewfinder) attached.

Measuring method:

1) Place the Siemens star 1.5m from the front of the lens reference plane (See Fig. 7-2.).
2) Set the zoom lever to the TELE position (66 mm) and turn on auto focus with the FOCUS button.
3) Adjust the position of the camera so that center of the Siemens star is lined up with the center of the monitor screen on the monitor TV screen.
4) To open the iris, reduce the illumination of the Siemens star to the range in which the ■ mark in the upper center of the EVF screen does not light up.
(Or cover lens with the ND filter)
5) Turn off the auto-focus with the FOCUS button.
6) Manually rotate the focus ring to set the focus. Confirm that the focus mark is inside the range shown in Fig. 7-38. at this time.
Perform Flange Back Adjustment if this condition is not satisfied.
7) Rotate the focus ring to the close extreme (1.1m).
8) Turn on the auto-focus with the FOCUS button.
9) Confirm that there is focusing within two seconds and a sharp image can be obtained.
10) Turn off the auto-focus and rotate the focusring to the far extreme (∞).
11) Turn on the auto-focus.
12) Confirm that there is focusing within two seconds and a sharp image can be obtained.

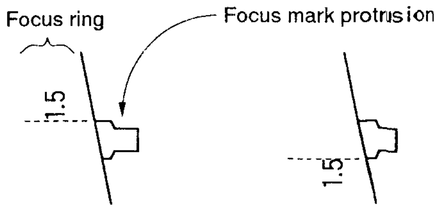


Fig. 7-38.

7-2-35. Y FM Carrier Frequency Adjustment (VC-60 Board)

Subject	All black (cover lens with black cap)
Mode	Camera recording
Measurement Point	TP161 on VS-37 board
Measuring Instrument	Frequency counter
Adjusting Element	RV502
Specified Value	4.28 ± 0.04 MHz

Connections:

1) Connect Pin (A8) (CAM Y) of the check point array and Pin ④ (CAM 5V) of W801 using a jumper wire.

Adjustment method:

1) Adjust RV502 to 4.28 ± 0.04 MHz.
2) Be sure to perform deviation adjustment.

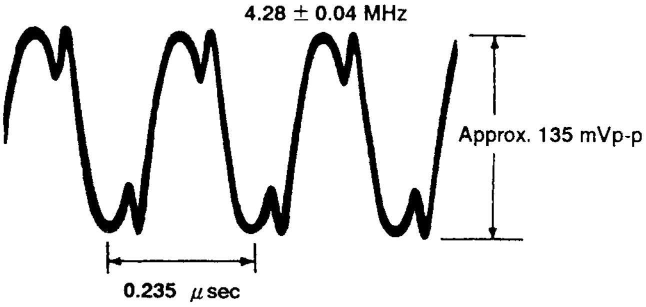


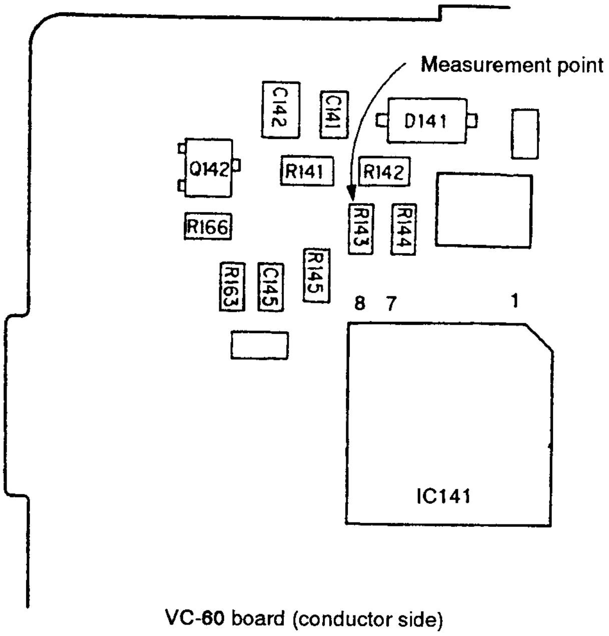
Fig. 7-39. Y FM carrier frequency adjustment

7-2-36. VCO Adjustment (VC-60 Board)

Subject	Arbitrary
Measurement Point	Pin ⑦ of IC141 (See Fig. 7-40.)
Measuring Instrument	Digital voltmeter
Adjusting Element	CT141
Specified Value	2.8 ± 0.2 Vdc

Adjustment method:

1) Set to 2.8 ± 0.2 Vdc with CT141.


Measurement point
C142
C141
D141
Q142
R141
R142
R166
R143
R144
R163
C145
R145
8
7
1
IC141

VC-60 board (conductor side)

Fig. 7-40. VCO adjustment

7-2-37. Y FM Deviation Adjustment (VC-60 Board)

Subject	All black (cover lens with black cap)
Mode	Camera recording and playback
Signal	All black signal recorded with the camera Alignment tape for checking operation (WR5-5CSP) Color bar section
Measurement Point	Video output terminal
Measuring Instrument	Oscilloscope
Adjusting Element	RV503
Specified Value	(Horizontal sync signal level of alignment tape) ± 0.015V

Note: 1) Confirm that "9-4-8. PB Y Level 1 Adjustment", "9-4-9. PB Y Level 2 Adjustment" and "7-2-35. Y FM Carrier Frequency Adjustment" of the video block adjustment have been completed.
2) Terminate the video input/output terminal (J901) at 75Ω .

Adjustment method:

1) Play the color bar section of the alignment tape (WR5-5CSP) and make a note of the horizontal sync signal level (approx. 0.3V) at this time.
2) Record the all black subject with the camera.
3) Play back the tape recorded in step 2).
4) Confirm that the horizontal sync signal level at this time is the same as the level noted in step 1).
   Specified value:
   (Horizontal sync signal level of alignment tape) ± 0.015V
5) If the specified value is not satisfied, repeat 2) to 4) after turning RV503 in the following manner.

	Rotation direction of RV503
When smaller than specified value	Counterclockwise (↺)
When larger than specified value	Clockwise (↻)

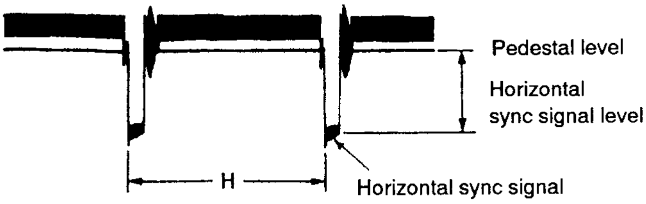


Fig. 7-41. Y FM deviation adjustment

7-2-38. Chroma Input Level Adjustment (VC-60 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin ① of IC503
Measuring Instrument	Oscilloscope
Adjusting Element	RV501
Specified Value	420 ± 10 mVp-p

Adjustment method:

1) Adjust the burst signal level to 420 ± 10 mVp-p using RV501.

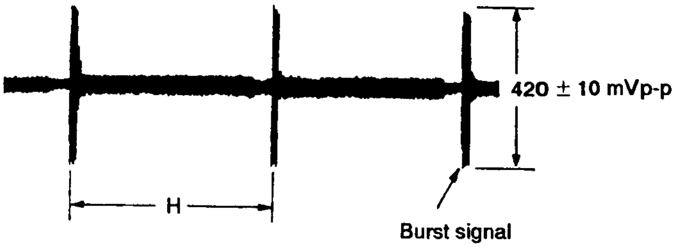


Fig. 7-42. Chroma input level adjustment

7-2-39. Recording Chroma RF Level Adjustment (VC-60 Board)

Subject	All black (cover lens with black cap)
Mode	Camera recording
Measurement Point	TP212 on VS-37 board
Measuring Instrument	Oscilloscope
Adjusting Element	RV504
Specified Value	250 ± 10 mVp-p

Adjustment method:

1) Adjust the burst signal level to 250 ± 10 mVp-p using RV504.

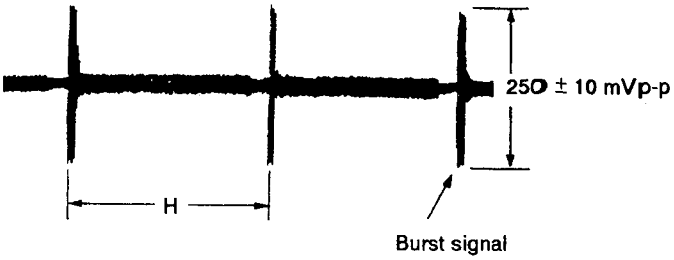


Fig. 7-43. Recording chroma RF level adjustment

7-2-40. REC Y Level Adjustment (VC-60 Board)

Subject	All black (cover lens with black cap)
Mode	Camera recording
Measurement Point	TP161 on VS-37 board
Measuring Instrument	Oscilloscope
Adjusting Element	RV505
Specified Value	135 ± 5 mVp-p

Connection:

1) Connect the positive side (white band side) of C517 and GND (Pin ③ of W303) using a jumper wire.

Adjustment method:

1) Adjust to 135 ± 5 mVp-p using RV505.

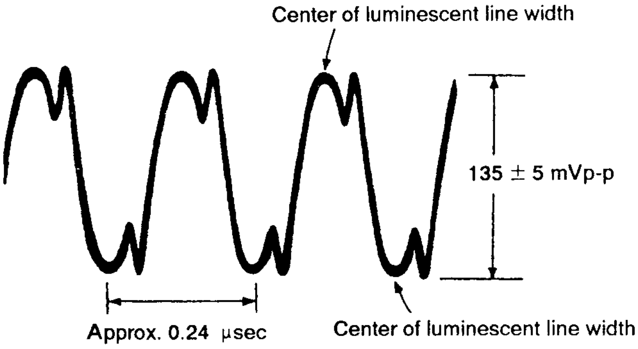

Center of luminescent line width
135 ± 5 mVp-p
Approx. 0.24 μsec
Center of luminescent line width

Fig. 7-44. REC Y level adjustment

7-3. DIGITAL TITLER SYSTEM ADJUSTMENT

7-3-1. Titler PLL Adjustment (TI-15 Board)

Subject	Arbitrary
Measurement Point	TP804
Measuring Instrument	Digital voltmeter
Adjusting Element	CT801
Specified Value	2.42 ± 0.1 Vdc

Connection:

1) Connect TP801 (PLL ADJ) and TP803 (VDD) with a jumper wire.

Adjusting method:

1) Set to 2.42 ± 0.1 Vdc with CT801.

7-3-2. Title A/D Level Adjustment

Subject	Color bar chart standard picture frame
Measurement Point	Confirmed on monitor TV
Measuring Instrument	
Adjustment Address	15 (TITLE A/D)
Specified Value	Blue and black areas are superimposed (become white). Other areas do not change.

Note: Make sure that "Y Level Adjustment" has been completed.

Adjustment method:

1) Select adjustment address 15 with the adjustment remote controller.
2) Press the MEMORY button (S762 on CF-4 board).
3) Confirm that blue and black areas are superimposed and become white, and that red and magenta areas do not change.
4) If this condition is not satisfied, change the adjustment data with the adjustment remote controller and repeat steps 2) and 3).
5) Change the adjustment address to store the adjustment data in the memory.

Shaded area must change to white.

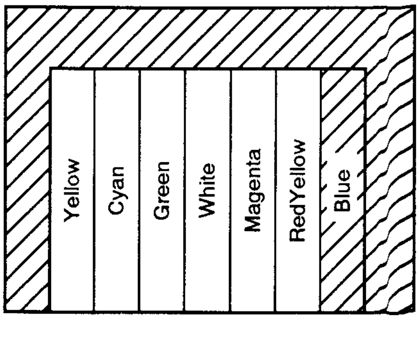


Fig. 7-45.

7-3-3. Title Pedestal Adjustment (VC-60 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin (A10) (CAM C) of check point array or video input/output terminal
Measuring Instrument	Oscilloscope
Adjustment Address	03 (PED)
Specified Value	4.43 MHz minimum chroma component

Note: Connect the EVF (electronic viewfinder) for adjustment.

Adjustment method:

1) Cover the lens with the black cap and press the MEMORY button (S762 on CF-4 board).
2) Confirm that "T WHT" characters are displayed in the EVF. (If another color is indicated, press the COLOR button (S763 on CF-4 board) until "T WHT" is indicated.)
3) Select adjustment address 03 with the adjustment remote controller.
4) Change the adjustment data with the adjustment remote controller to set the 4.43 MHz chroma component to minimum amplitude.
5) Change the adjustment address to store the adjustment data in the memory.

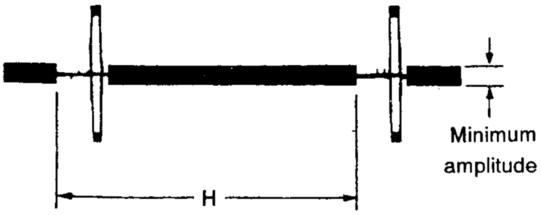


Fig. 7-46.

7-3-4. Title Y Level Adjustment (VC-60 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin (A8) (CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	10 (TITLE Y)
Specified Value	570 ± 80 mV

Note: Connect the EVF (electronic viewfinder) for adjustment.

Adjustment method:

1) Cover the lens with the black cap and press the MEMORY button (S657 on CF-4 board).
2) Confirm that "T WHT" characters are displayed in the EVF.
3) Select adjustment address 10 with the adjustment remote controller.
4) Change the adjustment data with the adjustment remote controller to set the Y signal level to 570 ± 80 mV.
5) Change the adjustment address to store the adjustment data in the memory.

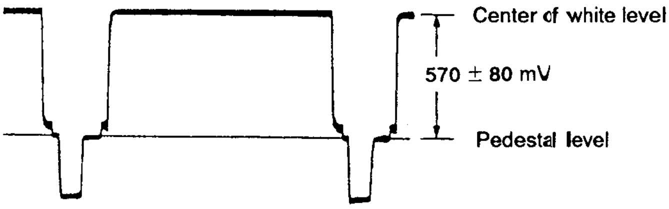


Fig. 7-47.

7-3-5. Character Generator f_0 Adjustment (TI-15 Board)

Subject	Arbitrary
Measurement Point	TP806 (Pin ⑦ of IC802)
Measuring Instrument	Frequency counter
Adjusting Element	CT802
Specified Value	6.38 ± 0.05 MHz

Connection:

1) Connect TP805 (Pin ⑳ of IC802) and TP803 (VDD) using a jumper wire.

Adjustment method:

1) Adjust to 6.38 ± 0.05 MHz using CT802.

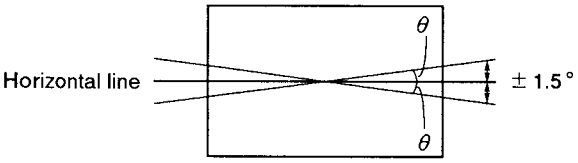
7-4. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT

7-4-1. Horizontal Tilt Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified Value	See Fig. 7-48.

Adjustment method:

1) By turning RV954 (BRIGHT), adjust for a luminance level which provides appropriate visibility of the CRT screen.
2) Loosen the DY (deflection yoke) tightening nut.
3) Make the image horizontal by rotating DY.
4) Retighten the DY tightening nut. (Do not tighten excessively.)


θ
Horizontal line
± 1.5°
θ

Specified value: Image orientation within ± 1.5° of horizontal line.

Fig. 7-48.

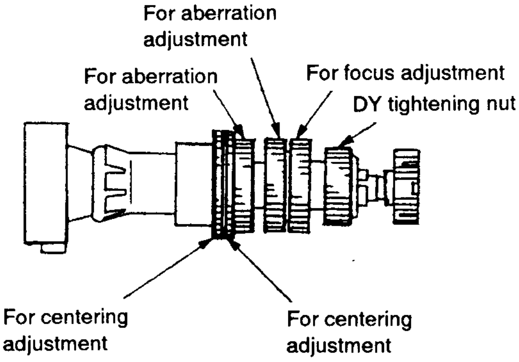

For aberration adjustment
For aberration adjustment
For focus adjustment
DY tightening nut
For centering adjustment
For centering adjustment

Fig. 7-49.

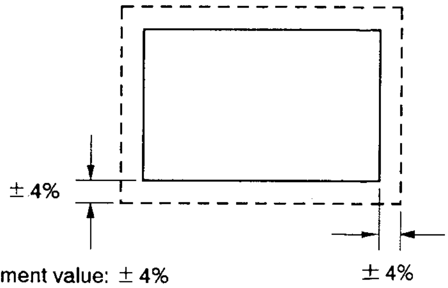
7-4-2. Centering Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified Value	See Fig. 7-50.

Adjustment method:

1) Turn the centering adjustment rings to provide an image with even right, left, upper and lower margins. (See Fig. 7-49.)

Note: Since the centering position is affected by the earth magnetism, turn the equipment over 360 ° horizontally, and make adjustments at the orientation which exhibits median displacements of the image.



Adjustment value: ± 4%

Fig. 7-50.

7-4-3. Focus Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion

Adjustment method:

1) Adjust for optimum focus using the focus ring. (See Fig. 7-49.)

7-4-4. Aberration Adjustment

Mode	E–E
Signal	Dot pattern
Specified Value	See Fig. 7-51.

Adjustment method:

1) Use the aberration adjustment rings to adjust any trailing dots to within 2 times the dot diameter and any fan shaped aberrations to within the dot diameter.
2) If off center, repeat the Centering Adjustment.

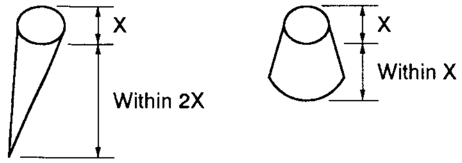


Fig. 7-51.

7-4-5. Horizontal Oscillation Frequency Adjustment (VF-19 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP)
Measurement Point	Positive terminal of C954
Measuring Instrument	Digital voltmeter or oscilloscope (DC range)
Adjusting Element	RV951
Specified Value	2.60 ± 0.05 Vdc

Adjustment method:

1) Adjust to 2.60 ± 0.05 Vdc using RV951.

7-4-6. Horizontal Amplitude Adjustment (VF-19 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjusting Element	C961
Specified Value	6 ± 2%

Adjustment method:

1) Line up the upper and lower sections of the monoscope image with the upper and lower edges of the screen by rotating RV952.
2) Rotate RV954 to set the brightness to the normal level.
3) Short or open the pattern (A) of the H size adjustment capacitor (C961) to provide horizontal overscans of 6 ± 2% (total of left and right). (See Fig. 7-53.)

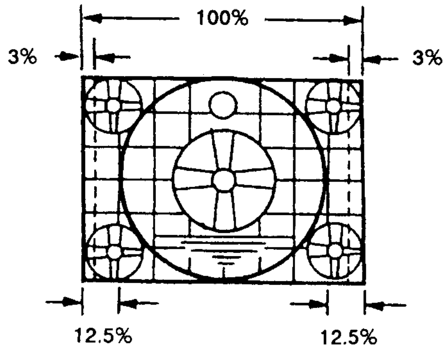
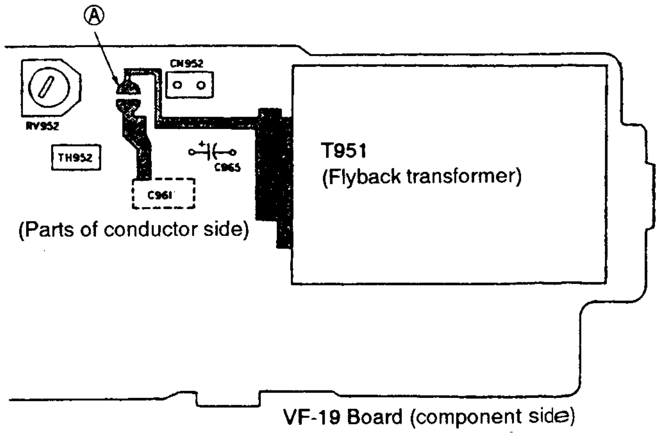


Fig. 7-52.



A section	H size
Short	Large
Open	Small

Fig. 7-53.

7-4-7. Vertical Amplitude Adjustment (VF-19 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjusting Element	RV952
Specified Value	5 ± 2%

Adjustment method:

1) By turning RV952, adjust vertical overscan to 5 ± 2%. (upper and lower total)

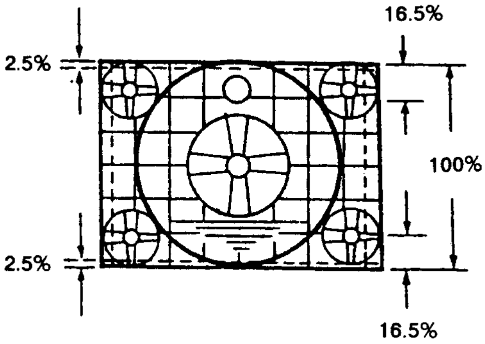


Fig. 7-54.

7-4-8. Brightness, Contrast Adjustments (VF-19 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjusting Element	Brightness: RV954 Contrast: RV953

Adjustment method:

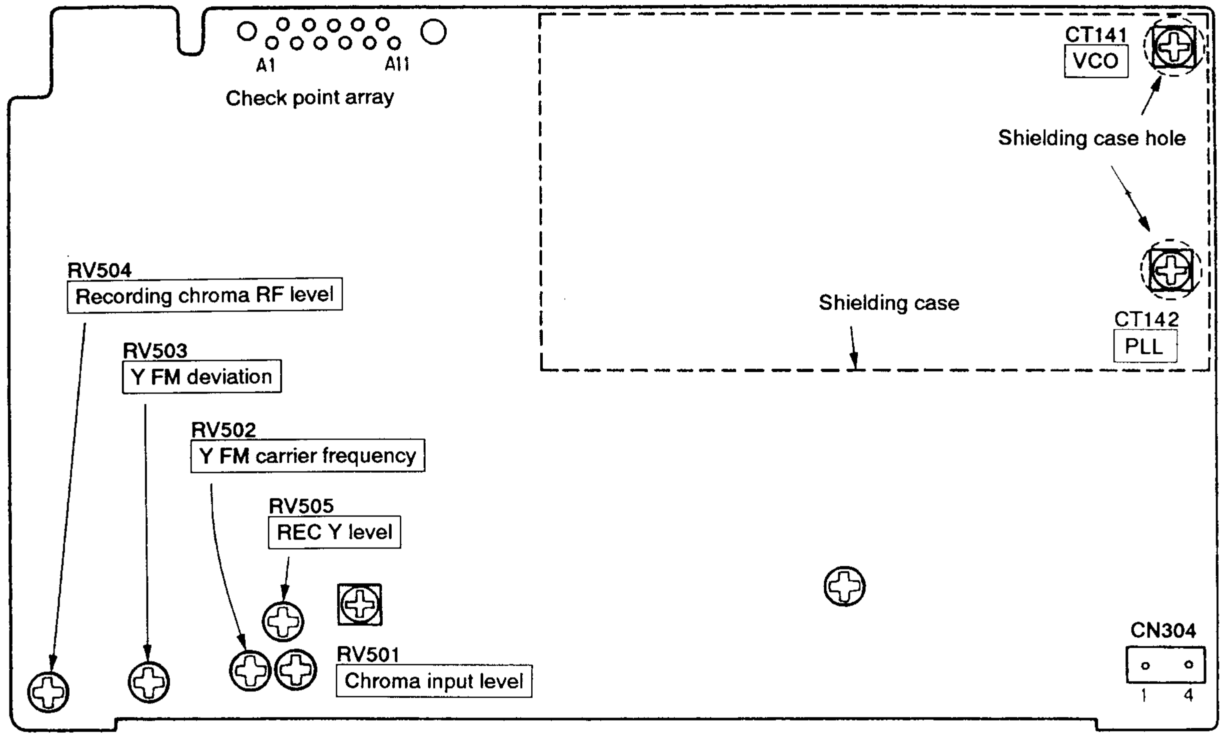
1) Rotate RV954 and RV953 alternately until the bright and dark areas of a gray scale are displayed correctly. (The bright areas should not be made too bright to avoid a fuzzy display of the cross-hatches in the monoscope circle, and the brightness of the dark areas should be such that discrimination between the darkest and second darkest area is possible.)

7-4-9. Horizontal Amplitude, Vertical Amplitude and Focus Checks

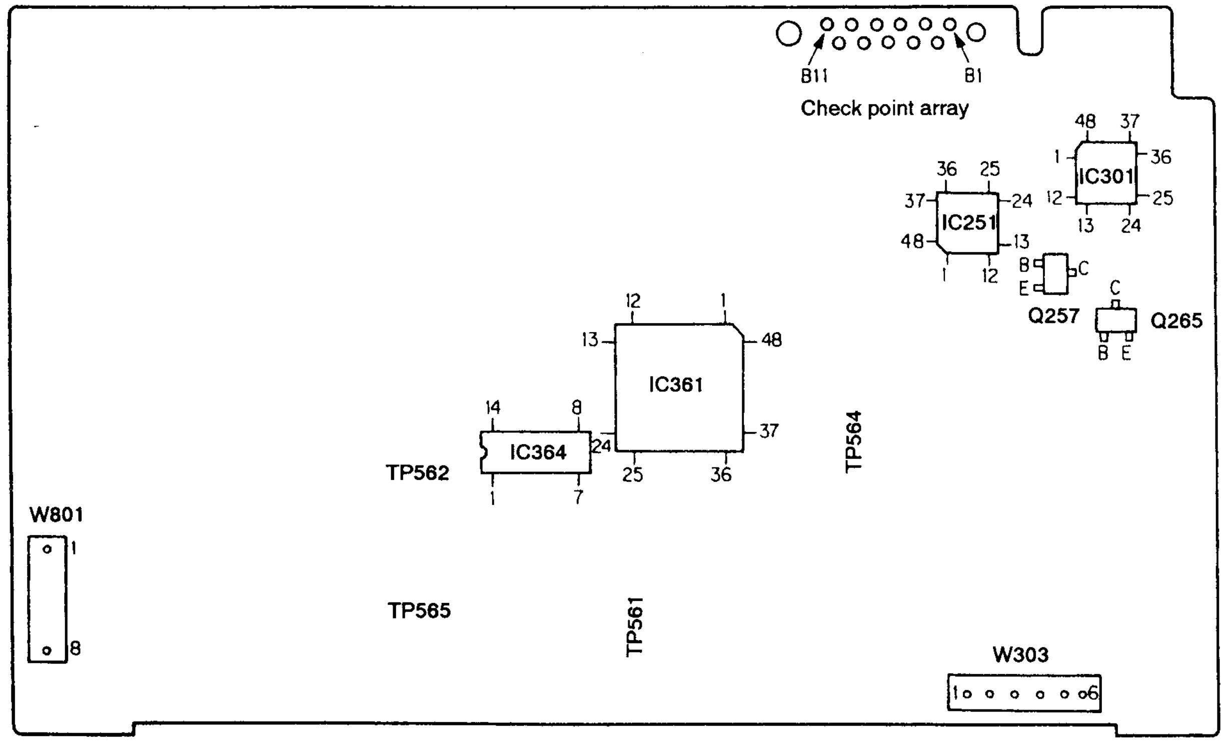
Values should conform to specifications given in 7-4-6. Horizontal Amplitude Adjustment and 7-4-7. Vertical Amplitude Adjustment. If not, readjust accordingly, and repeat 7-4-8. Brightness, Contrast Adjustments. In this case, focus needs to be checked. If the image is not clear, perform 7-4-3. Focus Adjustment and 7-4-4. Aberration Adjustment.

7-5. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

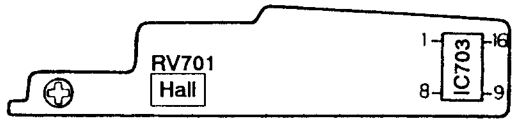
VC-60 BOARD (COMPONENT SIDE)


A1
A11
Check point array
CT141
VCO
Shielding case hole
Shielding case
CT142
PLL
RV504
Recording chroma RF level
RV503
Y FM deviation
RV502
Y FM carrier frequency
RV505
REC Y level
RV501
Chroma input level
CN304
1
4

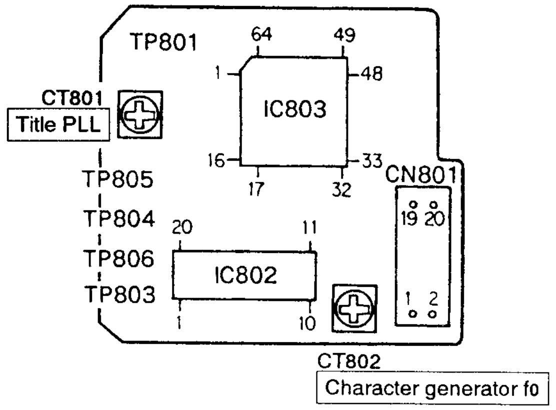
VC-60 BOARD (CONDUCTOR SIDE)


B11
B1
Check point array
IC301
IC251
Q257
Q265
IC361
IC364
TP562
TP564
TP565
TP561
W801
W303

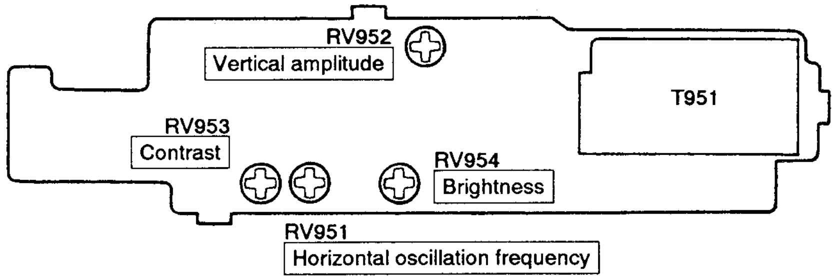
LD-11 BOARD (COMPONENT SIDE)


RV701
Hall
IC703

TI-15 BOARD (COMPONENT SIDE)


TP801
CT801
Title PLL
IC803
TP805
TP804
TP806
TP803
IC802
CN801
CT802
Character generator f0

VF-19 BOARD (COMPONENT SIDE)


RV952
Vertical amplitude
T951
RV953
Contrast
RV954
Brightness
RV951
Horizontal oscillation frequency

SECTION 8

MECHANICAL ADJUSTMENT

MECHANICAL ADJUSTMENT

As to the mechanical adjustment and check and parts replacement, refer to the separate "8 mm Video Mechanical Adjustment Guide II FL mechanism (Q mechanism).
However, follow these items shown below.

8-1. OPERATING WITH THE CASSETTE COMPARTMENT ASSEMBLY REMOVED (See Fig. 8-1.)

1. Loading

1) Remove the cabinets and camera block according to the section 2. DISASSEMBLY, and supply the power to the unit. (Set up the mechanism deck so as to operate.)
2) Push into the lock plate release arm ❶ in the direction of arrow, causing the unit to be the loading state.

2. Putting into the playback state

1) Short circuit Pins ③ and ⑧ of CN204 on the VS-37 board to set to the TEST mode.
   (In the TEST mode, the rotation detecting, etc. of the S and T reel tables is ceased. This enables the tape traveling.)
2) After completing the step 1), set the power switch to VTR.
3) Put the cap ❸ on the LED assembly ❷.
4) Push into the lock plate release arm ❶ to load.
5) Press the playback button.

3. Putting into the recording state

1) Perform the step 1) through 4) of 2. Putting into the playback state.
2) Secure the push switch ❹ with an adhesive tape ❺.
3) Turn on the REC switch.

4. Ejecting

1) Push the EJECT button.

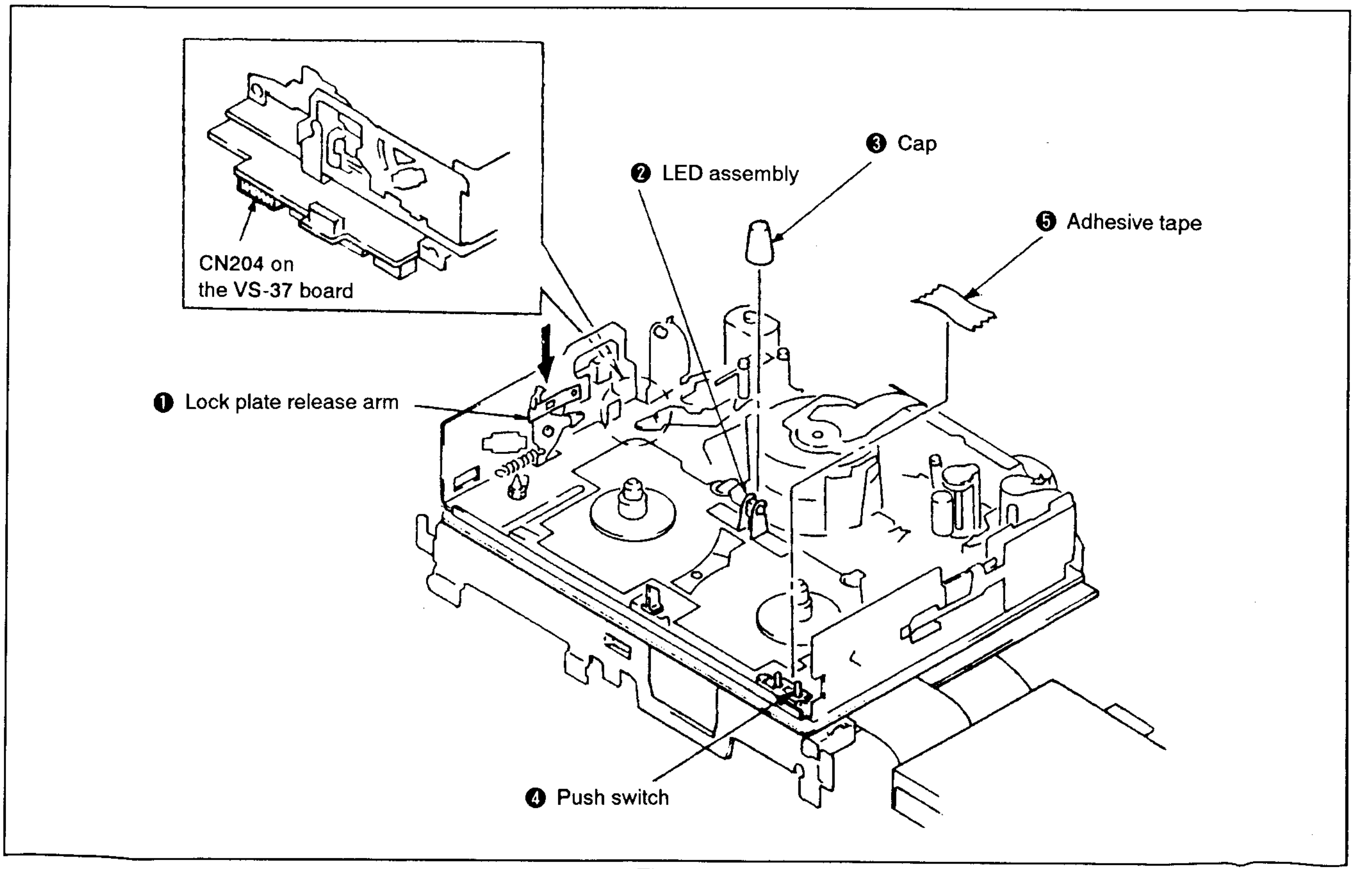


Fig. 8-1.

8-2. TAPE PATH ADJUSTMENT

1. Preparations

1) Clean the tape pass surface(tape guide, drum, capstan shaft and pinch roller).
2) Short circuit Pins ③ and ⑦ of CN204 on the VS-37 board to set to the PATH mode.
3) Connect to an oscilloscope.
   Channel 1 — Pin ① of CN204 on the VS-37 board
   External trigger — Pin ④ of CN204 on the VS-37 board
4) Play back the tracking alignment tape (WR5-1C).
5) Confirm that the RF waveforms at both sides of the entrance and exit on the oscilloscope are flat.
   If not, perform adjustment according to the following.

CN204 on the VS-37 board

1	PB RF CH1
2	PB RF CH2
3	PB RF GND
4	RF SWP
5	UN(1/2 RF SWP)
6	UN(REC C CHECK)
7	UN(PATH)
8	UN(TEST)
9	UN(CAM ADJ)
10	UN(SP)/LP
11	DRUM I COM
12	CAP FG

SECTION 9

VIDEO BLOCK ADJUSTMENTS

During the adjustments, see the arrangement diagram for adjustment parts from page 310.

9-1. PRE-ADJUSTMENT PREPARATIONS (VIDEO BLOCK)

Use the following measuring instruments for adjustment of the VTR block.

9-1-1. Equipment to be Used

1) Monitor TV
2) Dual trace oscilloscope of over 10 MHz band, incorporates delay mode. (Use 10 : 1 probe unless otherwise specified)
3) Frequency counter
4) Pattern generator with video output terminal
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuator
10) Regulated power supply
11) Alignment tapes
    Tracking adjustment (WR5-1C)
        Parts Code: 8-967-995-06
    Video frequency characteristics adjustment (WR5-6C)*1
        Parts Code: 8-967-995-17
    Operation check
        (WR5-4CL)*2 Parts Code: 8-967-995-56
        (WR5-5CSP)*3 Parts Code: 8-967-995-47

    Note:
    *1 WR5-2C (8-967-995-16) is also available.
    *2 WR5-3CL (8-967-995-36) is also available.
    *3 WR5-3CSP (8-967-995-27) and
    WR5-4CSP (8-967-995-46) are also available.
12) Adjustment remote controller (J-6082-053-A)

9-1-2. Connection of Equipment

Unless otherwise specified, adjustment is made with the measuring instrument connected as shown in the Fig. 9-1. below.

- Camera/video power switch ······· Video position
- Connect the adjustment remote commander to the remote terminal (J902 on the EL-1 board) when performing battery down adjustment.
- The mic board (MA-32 board) is not required for adjustments. Remove the following connectors:
  CN402 (3-pin) on the AU-51 board
- When the camera block hinders adjustments, remove the following connectors to separate:
  CN202 (7-pin) on the VS-37 board
  CN802 (16-pin) on the VC-60 board
  CN3 (8-pin) on the DC-DC converter
- When the EVF and cabinet (R) hinders adjustments, remove the following connectors:
  CN205 (4-pin) on the VS-37 board
  CN403 (2-pin) on the AU-51board

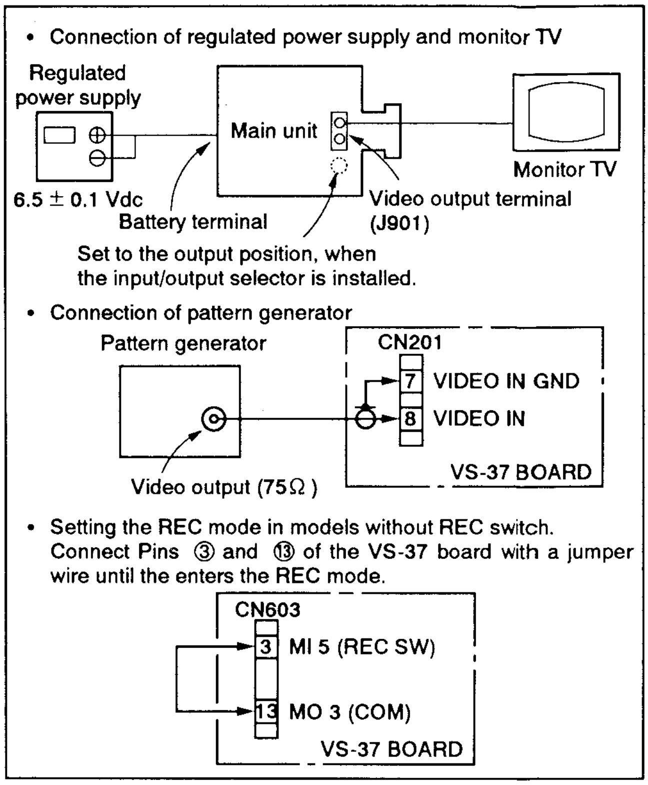

• Connection of regulated power supply and monitor TV
Regulated power supply
Main unit
Monitor TV
6.5 ± 0.1 Vdc
Battery terminal
Video output terminal (J901)
Set to the output position, when the input/output selector is installed.
• Connection of pattern generator
Pattern generator
CN201
7 VIDEO IN GND
8 VIDEO IN
Video output (75Ω)
VS-37 BOARD
• Setting the REC mode in models without REC switch.
Connect Pins ③ and ⑬ of the VS-37 board with a jumper wire until the enters the REC mode.
CN603
3 MI 5 (REC SW)
13 MO 3 (COM)
VS-37 BOARD

Fig. 9-1.

9-1-3. Note for SP/LP Switch Operation

Changing the SP/LP switch position after pressing the START/STOP button or the REC switch to start recording and before the capstan motor starts rotating may sometimes prevent proper rrecording.Use the SP/LP switch as follows:

1. Change the SP/LP switch position before pressing the START/STOP button or the REC switch.
2. If you have to change the SP/LP switch position after pressing the START/STOP button or the REC switch, first confirm that the tape is already moving.

9-1-4. Set-up During Adjustment

Since the video output signal obtained from the pattern generator is used as the adjusting signal for the VTR block electrical adjustment, it is necessary that this video output signal be within the required specifications. Connect an oscilloscope to Pin ⑧ of CN201 on the VS-37 board and make sure that the amplitude of the video SYNC signal is approximately 0.3V, that the video block amplitude is approximately 0.7V, that the burst signal amplitude is approximately 0.3V with flat characteristics, and the signal level ratio between the burst signal and "Red" signal is 0.30 : 0.66. The video signal (color bars) used for VTR block electrical adjustment are shown in Fig. 9-2.

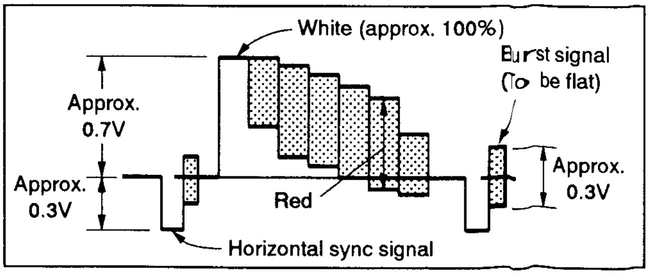
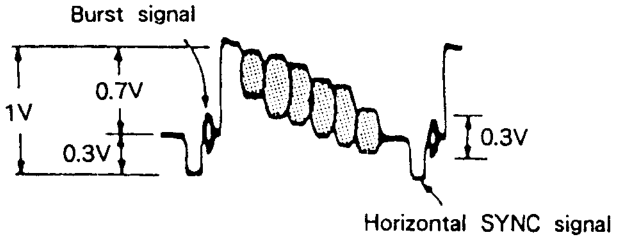
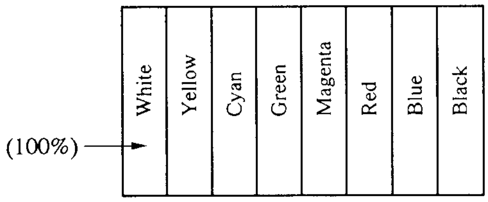

White (approx. 100%)
Burst signal
(To be flat)
Approx. 0.7V
Approx. 0.3V
Red
Approx. 0.3V
Horizontal sync signal

Fig. 9-2. Color bar signal of pattern generator

9-1-5. Alignment Tapes

Tape	Content	Use
Tracking (WR5-1C)	1. Recording area: PCM – video 2. Recording content: CH2:1MHz linearity adjustment signal (CH1: 9MHz)	Drum linearity adjustment
Video Frequency Response (WR5-6C)	1. Recording area: Video 2. Recording content: RF sweep 0 to 10MHz 3. Maker: 1, 3.58, 5.5 and 7MHz	Frequency response adjustment
Operation Check SP mode (WR5-5CSP) LP mode (WR5-4CL) Note: PCM area is not included in WR5-4CL	1. Recording area: Video 2. Recording content: ■ Video track •Video signals Color bars 4 minutes Monoscope 4 minutes (Color bars)  Burst signal 1V 0.7V 0.3V 0.3V Horizontal SYNC signal  White Yellow Cyan Green Magenta Red Blue Black (100%) •Audio signals(AFM) 400Hz 60% modulation ■ PCM area •Audio signals(PCM) 1kHz 4 minutes — Color bar 20Hz 2sec 400Hz 4sec 14kHz 2sec } Iterative Monoscope	Operation check

9-1-6. I/O Level and Impedance

E, Australian model

[I/O level and Impedance]

Video input/output phone jack
Input signal: 1 Vp-p, 75Ω unbalanced, negative sync
Audio input/output phone jack
Input level: –7.5 dBs (0 dBs=0.775 Vrms)
Input impedance: More than 47 kΩ
Output level: –7.5 dBs (at output impedance 47kΩ)
Output impedance: More than 2.2 kΩ

AEP, UK model

[Output level and Impedance]

Video output phone jack
Output signal: 1 Vp-p, 75Ω unbalanced, negative sync
Audio output phone jack
Specified output: –7.5 dBs
Output impedance: More than 2.2 kΩ

- **Service mode error indication**

Error Status	PRESENT EMG Indication	LAST EMG Indication
No error	00 : 00	00 : 00
Loading motor	00 : 01	00 : 01
REEL FG error during unthreading	00 : 02	00 : 02
REEL FG error not during unthreading	00 : 03	00 : 03
Capstan error	00 : 04	00 : 04
DRUM PG error (0) when starting drum	00 : 05	00 : 05
DRUM PG error (1) when starting drum	01 : 05	00 : 14
DRUM PG error (2) when starting drum	02 : 05	00 : 15
No DRUM PG (0) when starting drum	00 : 06	00 : 06
No DRUM PG (1) when starting drum	01 : 06	00 : 14
No DRUM PG (2) when starting drum	02 : 06	00 : 15
DRUM FG error (0) when drum stationary	00 : 07	00 : 07
DRUM FG error (1) when drum stationary	01 : 07	00 : 14
DRUM FG error (2) when drum stationary	02 : 07	00 : 15
No DRUM PG (0) when drum stationary	00 : 08	00 : 08
No DRUM PG (1) when drum stationary	01 : 08	00 : 14
No DRUM PG (2) when drum stationary	02 : 08	00 : 15
Phase error (0) when drum stationary	00 : 09	00 : 09

(1) During tape threading
(2) During tape unthreading
(0) Other

4. Releasing service mode

The service mode is released by returning the HOLD switch of the adjustment remote controller to the NORMAL position or by disconnecting the adjustment remote controller from the remote terminal.

9-2. POWER SUPPLY BLOCK CHECKS

9-2-1. Power Supply Check (VS-37 Board)

Measuring Instrument	Digital voltmeter
VIDEO 5V	
Measurement Point	Pin ② of W605
Specified Value	4.90 $^{+0.1}_{-0.07}$ V
REG 5V	
Measurement Point	Pin ③ of W605
Specified Value	4.85 ± 0.1V
EVF 5V	
Measurement Point	Pin ① of W605
Specified Value	4.96 ± 0.05V
EVER 5V	
Measurement Point	Pin ② of W604
Specified Value	5 $^{+0.2}_{-0.25}$ V

Checking method:

1) Each power supply voltage should satisfy the corresponding specified value.

9-1-7. Service Modes

This unit is equipped with service modes for adjustment and operation checking.

There are the following two service modes and switching between them is by connection between GND and Pin (B6) of the check point array CPA001on the VC-60 board.

Service Mode	Function	Connection between GND and Pin (B6) of the check point array
Status indication mode	For video block adjustment, operation checking	Open (no connection)
EVR adjustment mode	For adjustment of camera block	Shorted

Refer to Camera Block Adjustment for details on the EVR adjustment mode.

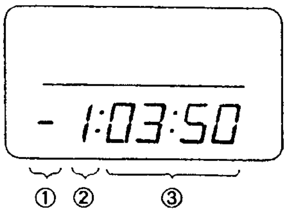
1. Invoking service mode

1) Connect the adjustment remote controller to the remote terminal (J902 on EL-1 board) of the main unit.
2) Set the HOLD switch of the adjustment remote controller to the HOLD position (SERVICE position).

The status indication mode is invoked by the above operation. (To select the EVR adjustment mode, connection between Pin (B6) of the check point array CPA001 and GND is required.)

2. Indication on adjustment remote controller LCD in status indication mode

Note: In categories 1 through 5, the same information is displayed in the EVF screen.



①...... Minus segment flashes to indicate that the service mode has been invoked.

②...... Indicates service mode category.

③...... Indicates battery voltage, LAST EMG, PRESET EMG, or MODE SW CODE. or DEW MODE according to current category.

3. Category selection and indication in each category

Select the desired category with the $\boxed{\text{FF}}$ button of the adjustment remote controller. There are five categories (1 through 5) and the indications are different for each. (Note that category 0 is the EVR adjustment mode.)

<table>
<tr><th>Caategory</th><th colspan="2">Indication on LCD</th></tr>
<tr><td>1</td><td colspan="2">A/D conversion value for battery voltage (decimal indication)[*1]
00 : 00 – 02 : 55</td></tr>
<tr><td>2</td><td colspan="2">LAST EMG (last emergency)[*2]
Refer to Service Mode Error Indications.</td></tr>
<tr><td>3</td><td colspan="2">PRESENT EMG (current emergency)[*3]
Refer to Service Mode Error Indications.</td></tr>
<tr><td rowspan="8">4</td><td colspan="2">MODE SW CODE (mechanism status)</td></tr>
<tr><td>00 : 01</td><td>READY</td></tr>
<tr><td>00 : 02</td><td>GL</td></tr>
<tr><td>00 : 03</td><td>USE</td></tr>
<tr><td>00 : 04</td><td>EJECT</td></tr>
<tr><td>00 : 05</td><td>RP(REC, PB, FF, REW, CUE, REVIEW, PAUSE)</td></tr>
<tr><td>00 : 06</td><td>LS</td></tr>
<tr><td>00 : 07</td><td>BL</td></tr>
<tr><td rowspan="4">5</td><td colspan="2">DEW MODE</td></tr>
<tr><td>00:00</td><td>NORMAL</td></tr>
<tr><td>00:01</td><td>SENSOR ON DEW MODE
(sensor in DEW mode)</td></tr>
<tr><td>00:02</td><td>SENSOR OFF DEW MODE
(Restart of operation is possible after the following conditions have been satisfied:
1. EJECT
2. More than 1H has elapsed.)</td></tr>
</table>

Notes: 1) Indicates a value proportional to the battery voltage.

2) LAST EMG indicates the error occurring last before entering service mode. Even if an error occurs in the service mode, it is not indicated.

3) PRESENT EMG indicates the status when the $\boxed{\text{FF}}$ button of the adjustment remote controller was pressed. So, the indication does not change even if the error is eliminated.

9-3-3. Clock Precision Adjustment (VC-60 Board)

Note: Perform the adjustment with the lens and the LCD (CN806) removed.

Mode	Power OFF
Measurement Point	TP561 (Pin (54) of IC561)
Measuring Instrument	Frequency Counter
Adjusting Element	CT561
Specified Value	512.000 ± 0.003 Hz

Note: When performing this adjustment, be sure not to connect the LCD.

Adjustment method:

1) Turn off the power.
2) Connect TP564 ($\overline{\text{TEST}}$) and TP565 (GND) using a jumper wire. (TEST mode)
3) Supply 3V (3.0 ± 0.05 Vdc) of power to Pin ⑮ of CN804 from a regulated power supply.
4) Adjust to 512.000 ± 0.003 Hz with CT561.
5) Remove the jumper wire.

TP561 measuring waveform

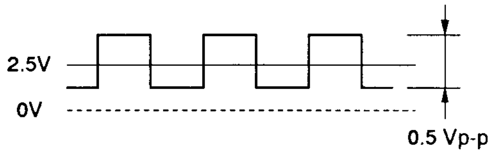


Fig. 9-6.

9-4. SERVO SYSTEM ADJUSTMENTS

9-4-1. Capstan FG Frequency Check (VS-37 Board)

Mode	Recording (SP/LP)
Signal	Arbitrary
Measurement Point	Pin ⑫ (CAP FG) of CN204
Measuring Instrument	Frequency counter
Specified Value	SP mode: 1145.5 ± 2 Hz LP mode: 574.7 ± 2 Hz

Checking method:

1) Set to the SP position, when SP/LP switch (CF-4 board) is connected.
2) Set to recording mode and confirm that the capstan FG frequency is 1145.5 ± 2 Hz.
3) Set the SP/LP switch to the LP position (or connect Pin ⑩ (UN (SP)/LP) of CN204 and GND using a jumper wire.).
4) Set to recording mode and confirm that the capstan FG frequency is 574.7 ± 2 Hz.
5) Remove the jumper wire connected in step 2).

9-4-2. Capstan FG Offset Adjustment (VS-37 Board)

Mode	Recording (SP)
Signal	Arbitrary
Measurement Point	Pin ⑫ (CAP FG) of CN204
Measuring Instrument	Oscilloscope
Adjusting Element	RV502
Specified Value	Duty cycle=50 ± 1%

Adjustment method:

1) Set the CAP FG output waveform duty cycle to 50% using RV502.

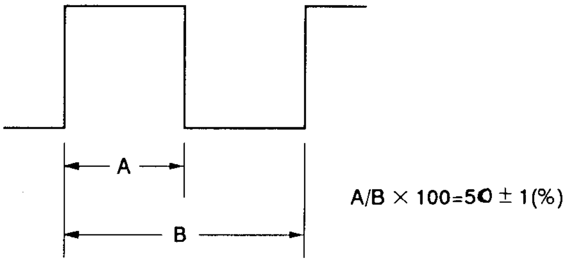


Fig. 9-7. Capstan FG offset adjustment

9-3. SYSTEM CONTROL ADJUSTMENTS

9-3-1. Battery Down Adjustment (DC/DC Converter Unit)

Mode	Recording
Signal	Arbitrary
Measurement Point	Confirmation on monitor screen
Measuring Instrument	
Adjusting Element	VR of DC-DC converter unit
Specified Value	-1 : 01 : 46

Connect to the camera and EVF blocks to perform the adjustment and confirmation.

Connections:

1) Connect a regulated power supply and digital voltmeter as shown in Fig. 9-3.
2) Connect Pin ⑧ (TEST) and Pin ③ (PB RF GND) of CN204 on VS-37 board with a jumper wire. (TEST mode)

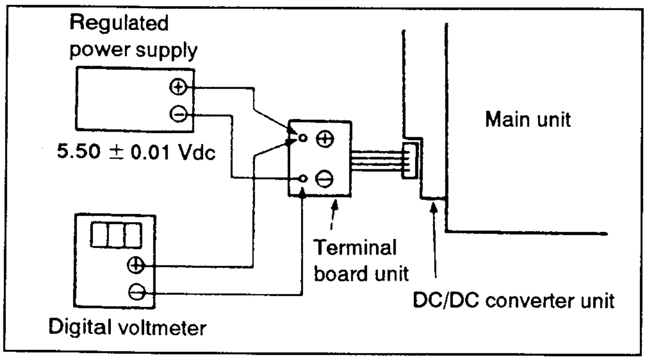
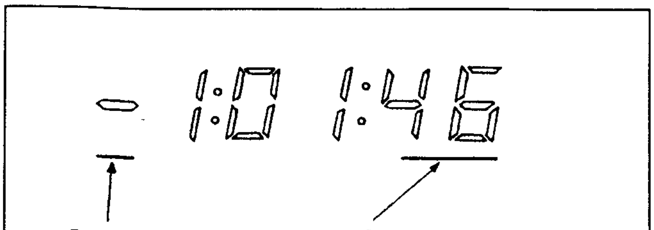


Fig. 9-3.

Adjustment method:

1) Connect the adjustment remote controller to the remote terminal (J902 on EL-1 board).
2) Set the power switch (S901) on the FK-9 board to the camera position.
3) Set the HOLD switch on the adjustment remote controller to the HOLD position (service position).
4) Confirm that the indication on the digital voltmeter is 5.50 ± 0.01 Vdc.
5) Set the LCD counter indication on the adjustment remote controller to " − 1:01:46" using the DC/DC converter unit VR (refer to Fig. 9-4.).



Ⓐ This portion should be flashing.

Ⓑ Battery indicator (🔋) flashes when this portion is 46 or less.

Fig. 9-4.

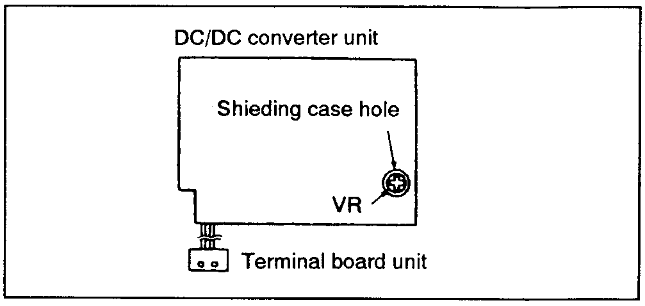


Fig. 9-5.

Checking method:
Perform the following checks and repeat the adjustments again if the required conditions are not satisfied.

1) Adjust the output voltage of the regulated power supply so that the digital voltmeter indication becomes 5.65 ± 0.01 Vdc. (VTR in camera recording mode)
2) Confirm that the 🔋 mark is not lit on the EVF (viewfinder) screen (TALLY lamp is lit).
3) Lower the output voltage of the regulated power supply so that the digital voltmeter indication becomes 5.53 ± 0.01 Vdc.
4) Confirm that the 🔋 mark and the TALLY lamp are flashingin approx. 1 sec. intervals on the EVF screen.
5) Lower the output voltage of the regulated power supply so that the digital voltmeter indication becomes 5.47 ± 0.01 Vdc.
6) Confirm that the flashing of the 🔋 mark and the TALLY lamp on the EVF screen becomes faster, and that the VTR stops and the power is turned off.

9-3-2. System Clock Adjustment (VC-60 Board)

Note: Perform the adjustment with the lens removed.

Mode	Power ON
Measurement Point	TP562 (Pin (59) of IC561)
Measuring Instrument	Frequency counter
Adjusting Element	RV561
Specified Value	330 ± 5 kHz

Adjustment method:

1) Adjust with RV561 so that it becomes 330 ± 5 kHz.

9-4-3. Drum Driver MMW Adjustment (VS-37 Board)

Mode	Recording (SP)
Signal	Arbitrary
Measurement Point	Pin ⑪ (DRUM 1 COM) of CN204
Measuring Instrument	Oscilloscope
Adjusting Element	RV501
Specified Value	Symmetrical waveform

Connection:

1) Connect the oscilloscope by inserting the filter as shown in the diagram below.

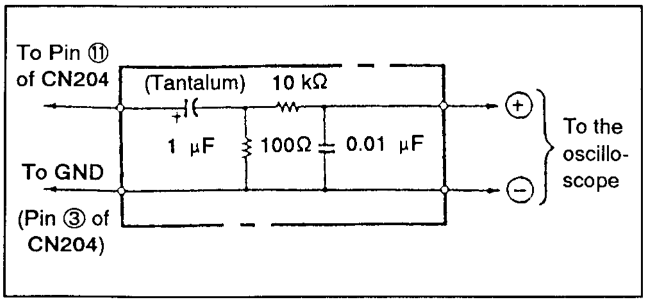

To Pin ⑪ of CN204
(Tantalum)
10 kΩ
1 μF
100Ω
0.01 μF
To GND
(Pin ③ of CN204)
To the oscilloscope

Fig. 9-8.

Adjustment method:

1) Adjust RV501 for a symmetrical waveform as shown below. Confirm that the drum motor sound becomes minimum at this time.

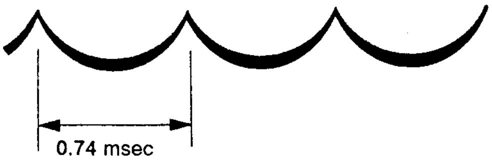


Fig. 9-9. Drum driver MMW adjustment

9-4-4. Drum Phase Lock Check (VS-37 Board)

Mode	Recording (SP)
Signal	Arbitrary
Measurement Point	CH-1: Pin ⑪ (SYSTEM SYNC) of IC601 CH-2: Pin ④ (RF SWP) of CN204
Measuring Instrument	Oscilloscope
Specified Value	224 ± 50 μsec

Checking method:

1) Set to recording mode.
2) Confirm that duration between the switching point of CH-2 (RF SWP) and the rising edge of CH-1 (SYSTEM SYNC) is 224 ± 50 μsec.

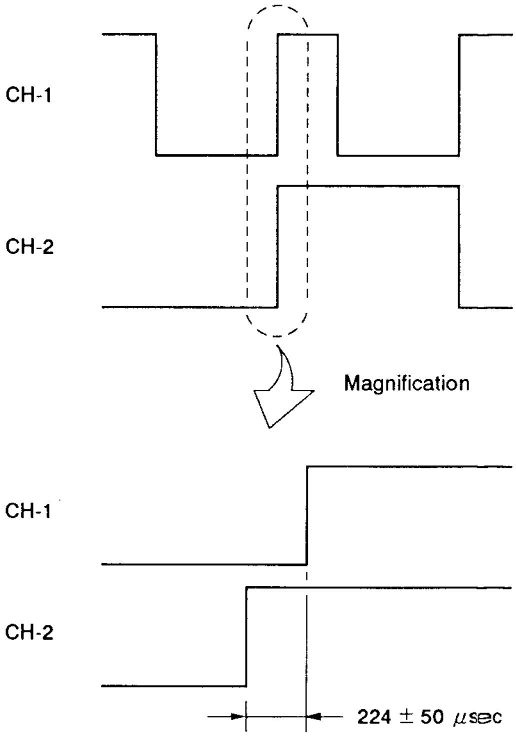

CH-1
CH-2
Magnification
CH-1
CH-2
224 ± 50 μsec

Fig. 9-10. Drum phase lock check

9-4-5. Switching Position Adjustment (VS-37 Board)

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-5CSP)
Measurement Point	CH-1: Video output terminal CH-2: Pin ④ (RF SWP) of CN204
Measuring Instrument	Oscilloscope
Adjusting Element	RV602
Specified Value	6.5 ± 0.3H (410 ± 20 µsec)

Connections:

1) Connect Pin ⑧ (UN(TEST)) and Pin ③ (PB RF GND) of CN204 using a jumper wire. (TEST mode)

Adjustment method:

1) Adjust to 6.5 ± 0.3H (410 ± 20 µsec) using RV602.

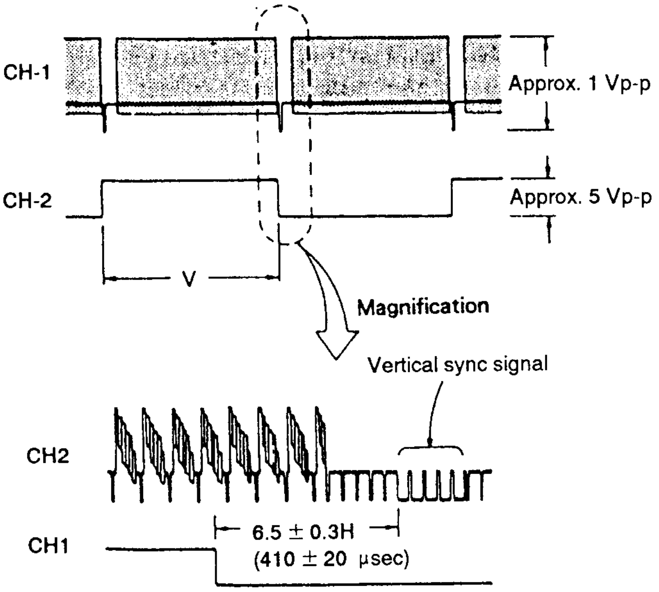


Fig. 9-11. Switching position adjustment

9-5. VIDEO BLOCK ADJUSTMENT

The adjustment of the video system should in principle follow the adjustment procedure outlined below.
The color video signal supplied from the pattern generator is utilized as the video input signal for video system adjustment in the recording mode. Make sure that the sync signal and color burst signal match the specifications given in set-up for adjustment, as shown in Fig. 9-2.

[Adjustment procedure]

1) Playback frequency characteristics adjustment
2) Flying erase check
3) Crystal oscillator fo adjustment
4) Y/C separation adjustment
5) IR2 adjustment
6) SYNC AGC adjustment
7) Emphasis input level adjustment
8) PB Y level 1 adjustment
9) PB Y level 2 adjustment
10) Y FM carrier frequency adjustment
11) Y FM deviation adjustment
12) Chroma emphasis fo adjustment
13) REC Y level adjustment
14) REC C RF level adjustment
15) REC C current adjustment
16) REC ATF level adjustment
17) Feedback chroma adjustment
18) Quasi burst phase adjustment
19) Delay burst phase adjustment

9-5-1. Playback Frequency Characteristics Adjustment (VS-37 Board)

Mode	Playback
Signal	Alignment tape: For frequency characteristics adjustment (WR5-6C)
Measurement Point	See Fig. 6-12a.
Measuring Instrument	Oscilloscope
Adjusting Element	RV111 (1a) RV113 (1b) RV112 (2a) RV114 (2b)
Specified Value	3.58 MHz level : 5.5 MHz level= 4:(3 ± 0.3)

Adjustment method:

1) Adjust each RV so that the ratio of the 3.58 MHz level to the 5.5 MHz level of the PB RF output waveform becomes 4:(3 ± 0.3) for 1a, 1b, 2a, and 2b respectively.

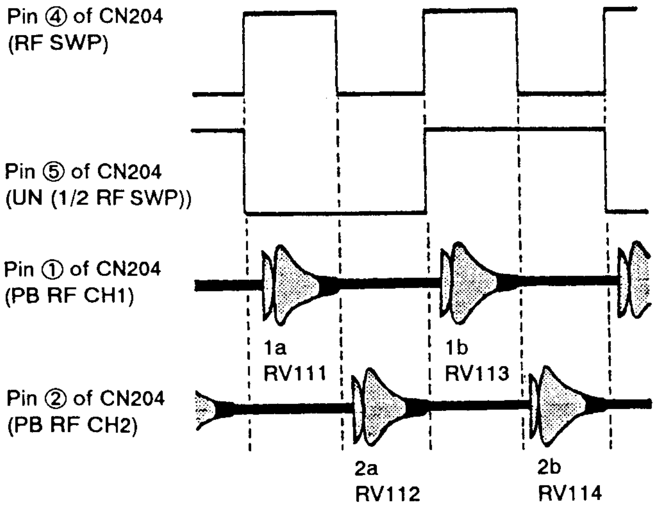

Pin ④ of CN204
(RF SWP)
Pin ⑤ of CN204
(UN (1/2 RF SWP))
Pin ① of CN204
(PB RF CH1)
Pin ② of CN204
(PB RF CH2)
1a
RV111
1b
RV113
2a
RV112
2b
RV114

Fig. 9-12a. Playback frequency characteristics adjustment

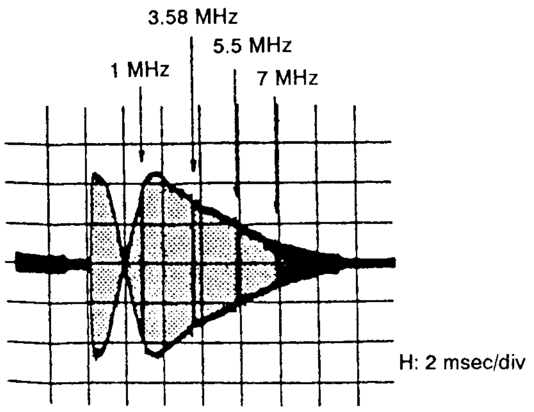

3.58 MHz
5.5 MHz
1 MHz
7 MHz
H: 2 msec/div

Fig. 9-12b. Playback frequency characteristics adjustment

9-5-2. Flying Erase Check (VS-37 Board)

Mode	Recording
Signal	Arbitrary
Measurement Point	Pin ⑮ of CN101 (FE (X))
Measuring Instrument	Oscilloscope and frequency counter
Specified Value	Frequency: Over 7.0 MHz Voltage: Over 6.0 Vp-p

Note: Be sure to use MP type tape. (Pin ⑫ of CN602 should be "L".)

Checking method:

1) Confirm that the oscillation frequency is over 7.0 MHz and the oscillation voltage is over 6.0 Vp-p.

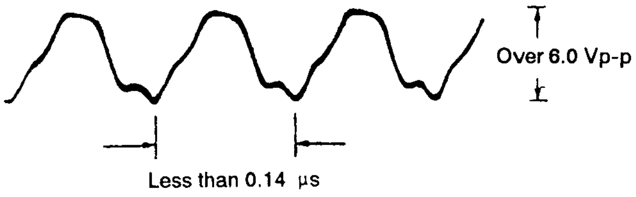

Over 6.0 Vp-p
Less than 0.14 μs

Fig. 9-13. Flying erase check

9-5-3. Crystal Oscillator fo Checking (VS-37 Board)

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-5CSP)
Measurement Point	Pin ㉕ of IC202
Measuring Instrument	Frequency counter
Specified Value	4433618 ± 100 Hz

Note: Connect the frequency counter through a buffer having high impedance (approx. 10 MΩ) and low capacitance (less than 10 pF).

Checking method:

1) Confirm that the oscillation frequency at Pin ㉕ of IC202 is 4433618 ± 100 Hz.

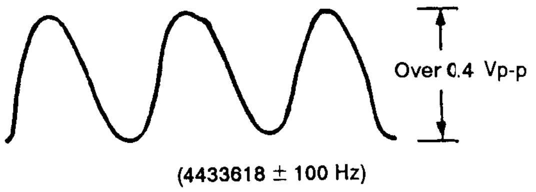

Over 0.4 Vp-p
(4433618 ± 100 Hz)

Fig. 9-14. Crystal oscillator fo adjustment

9-5-4. Y/C Separation Adjustment (VS-37 Board)

Mode	Recording
Signal	Color bars
Measurement Point	Any terminal of RV203 (DEV) (Pin ㉕ of IC203)
Measuring Instrument	Oscilloscope
Adjustment Element	RV207
Specified Value	Minimum residual chroma component

Connections:

1) Connect Pin ㊴ of IC203 (Pin ⑭ of IC202) to GND with a 10 μF/16V electrolytic capacitor. (Capacitor negative side to GND)

Adjustment method:

1) Set the residual chroma component to minimum with RV207.

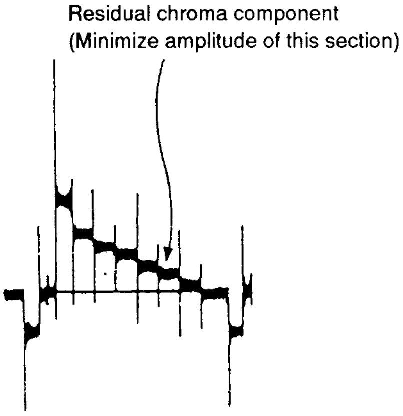

Residual chroma component
(Minimize amplitude of this section)

Fig. 9-15. Y/C separation adjustment

9-5-5. IR2 Adjustment (VS-37 Board)

Mode	Recording
Signal	Color bars
Measurement Point	Pin ⑧ of IC203 or base of Q229 (BF OUT)
Measuring Instrument	Oscilloscope
Adjustment Element	RV206
Specified Value	7.0 ± 0.2 μsec

Adjustment method:

1) Adjust RV206 so that it becomes 7.0 ± 0.2 μsec.

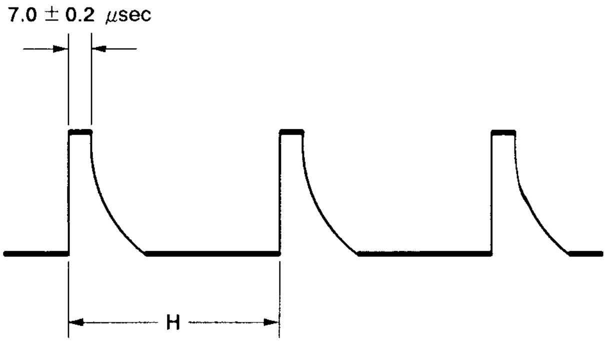


Fig. 9-16. IR2 adjustment

9-5-6. SYNC AGC Adjustment (VS-37 Board)

Mode	Recording
Signal	Color bar
Measurement Point	Pin ㊾ of IC203
Measuring Instrument	Oscilloscope
Adjustment Element	RV201
Specified Value	0.49 ± 0.025 Vp-p

Adjustment method:

1) Adjust with RV201 so that it becomes 0.49 ± 0.025 Vp-p.

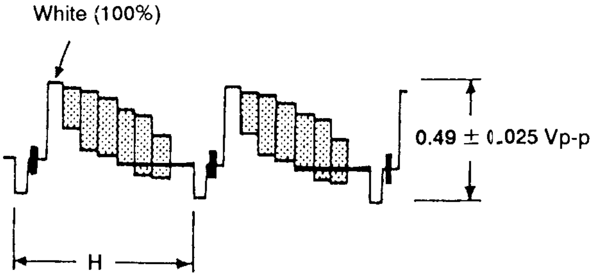


Fig. 9-17. SYNC AGC adjustment

9-5-7. Emphasis Input Level Adjustment (VS-37 Board)

Mode	Recording
Signal	Color bar
Measurement Point	Pin (54) of IC203
Measuring Instrument	Oscilloscope
Adjustment Element	RV205
Specified Value	0.50 ± 0.025 Vp-p

Adjustment method:
1) Adjust with RV205 so that it becomes 0.50 ± 0.025 Vp-p.
2) Always perform "PB Y Level 2 Adjustment" after this adjustment.

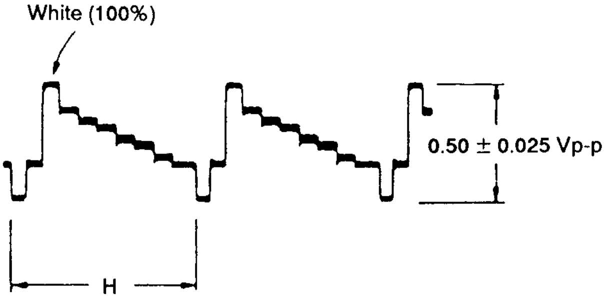


Fig. 9-18. Emphasis input level adjustment

9-5-8. PB Y Level 1 Adjustment (VS-37 Board)

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-5CSP) Color bar section
Measurement Point	Pin ㊼ of IC203 (Pin ⑤ of IC202)
Measuring Instrument	Oscilloscope
Adjustment Element	RV202
Specified Value	0.50 ± 0.025 Vp-p

Adjusting method:
1) Adjust to 0.50 ± 0.025 Vp-p with RV202.
2) Always perform "PB Y Level 2 Adjustment" after this adjustment.

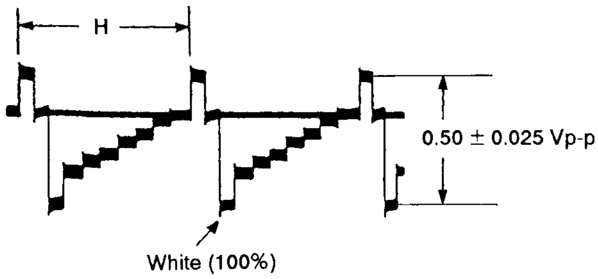


Fig. 8-19. PB Y level 1 adjustment

9-5-9. PB Y Level 2 Adjustment (VS-37 Board)

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-5CSP) Color bar section
Measurement Point	J901 (VIDEO OUT)
Measuring Instrument	Oscilloscope
Adjustment Element	RV208
Specified Value	$1.00^{+0.025}_{-0.05}$ Vp-p

Note: 1) Terminate VIDEO OUT (J901) at 75Ω.
2) Make sure that "PB Y Level 1 Adjustment" and "Emphasis Input Level Adjustment" have been completed.

Adjustment method:
1) Adjust with RV208 so that it becomes $1.00^{+0.025}_{-0.05}$ Vp-p.

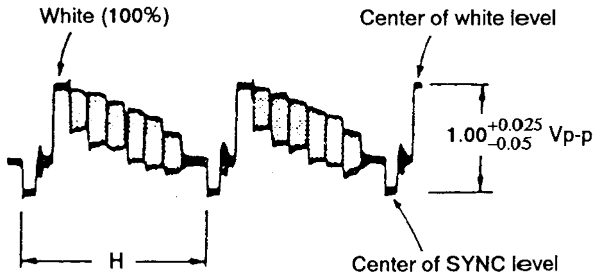


Fig. 9-20. PB Y level 2 adjustment

9-5-10. Y FM Carrier Frequency Adjustment (VS-37 Board)

Mode	Recording
Signal	No signal
Measurement Point	TP161
Measuring Instrument	Frequency counter
Adjustment Element	RV204
Specified Value	4.39 ± 0.02 MHz

Adjustment method:
1) Adjust to 4,39 ± 0.02 MHz with RV204.
2) Perform "Deviation Adjustment".

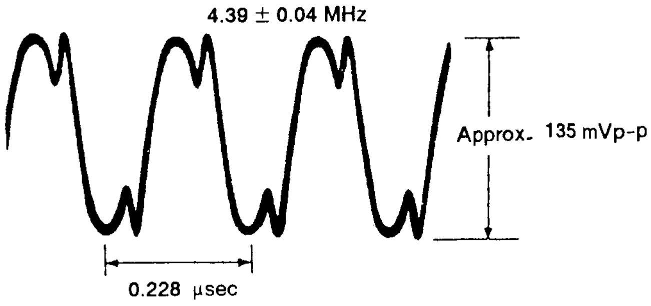


Fig. 9-21. Y FM carrier frequency adjustment

9-5-11. Y FM Deviation Adjustment (VS-37 Board)

Mode	Recording and playback
Signal	Color bar
Measurement Point	J901 (VIDEO OUT)
Measuring Instrument	Oscilloscope
Adjustment Element	RV203
Specified Value	Playback level is 1.00 ± 0.04 Vp-p

Notes: 1) Confirm that "Emphasis Input Level Adjustment", "PB Y Level 2 Adjustment" and "Y FM Carrier Frequency Adjustment" have been completed.
2) Terminate VIDEO OUT (J901) at 75Ω .

Adjustment method:
1) Record the color bar signal.
2) Playback the recorded signal.
3) Confirm the playback output.
Specified value: 1.00 ± 0.04 Vp-p
4) If the specified value is not satisfied, repeat 1) to 3) after turning RV203 in the following manner.

	Rotation direction of RV203
When larger than specified value	Clockwise (↻)
When smaller than specified value	Counterclockwise (↺)

Table 9-1.

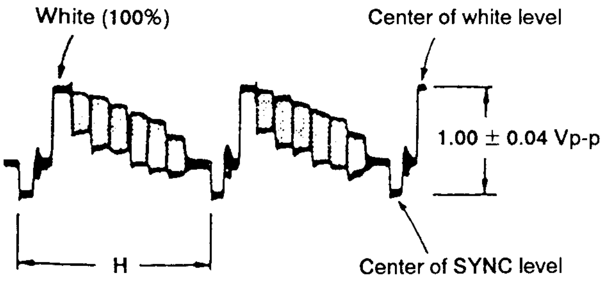


Fig. 9-22. Y FM deviation adjustment

9-5-12. Chroma Emphasis fo Adjustment (VS-37 Board)

Mode	Recording
Signal	Color bar
Measurement Point	TP212
Measuring Instrument	Oscilloscope
Adjustment Element	FL201
Specified Value	Minimum fo component

Adjustment method:
1) Adjust with FL201 so that amplitude of the flat section of the chroma signal REC section becomes minimum.

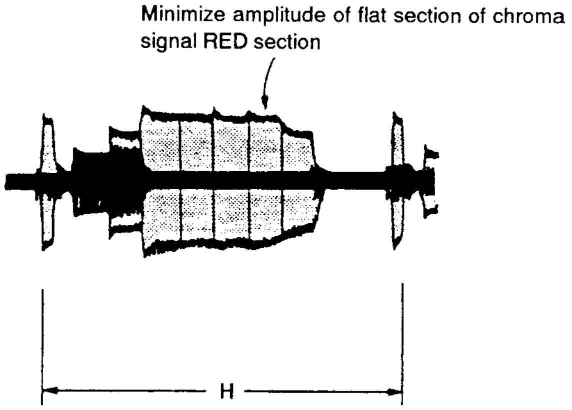

Minimize amplitude of flat section of chroma signal RED section
H

Fig. 9-23. Chroma emphasis fo adjustment

9-5-13. REC Y Level Adjustment (VS-37 Board)

Mode	Recording
Signal	No signal
Measurement Point	TP161
Measuring Instrument	Oscilloscope
Adjustment Element	RV209
Specified Value	135 ± 5 mVp-p

Adjustment method:

1) Adjust with RV209 so that it becomes 135 ± 5 mVp-p.

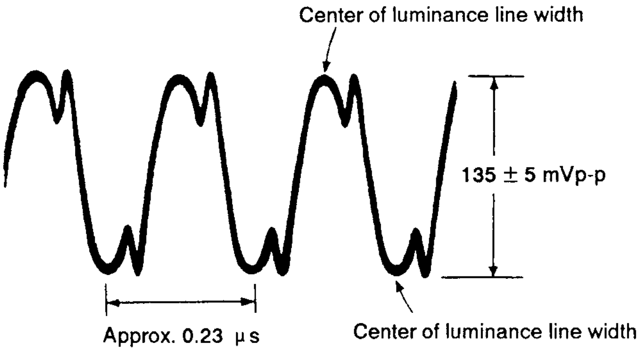

Center of luminance line width
135 ± 5 mVp-p
Approx. 0.23 µs
Center of luminance line width

Fig. 9-24. REC Y Level Adjustment

9-5-14. REC C Level Adjustment (VS-37 Board)

Mode	Recording
Signal	Color bar
Measurement Point	TP212
Measuring Instrument	Oscilloscope
Adjustment Element	RV210
Specified Value	250 ± 10 mVp-p

Adjustment method:

1) Adjust with RV210 so that it becomes 250 ± 10 mVp-p.

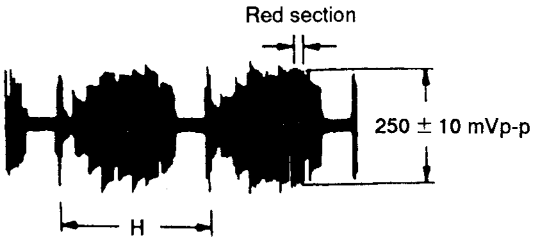

Red section
250 ± 10 mVp-p
H

Fig. 9-25. REC C level adjustment

9-5-15. REC C Current Adjustment (VS-37 Board)

Mode	Recording (SP mode)
Signal	Color bar
Measurement Point	CH-1 (1:1 probe): TP101 (1a) TP103 (1b) TP102 (2a) TP104 (2b) CH-2 (10:1 probe): Pin ⑤ (1/2 RF SWP) of CN204
Measuring Instrument	Oscilloscope
Adjusting Element	RV101 (1a) RV103 (1b) RV102 (2a) RV104 (2b)
Specified Value	20.0 ± 1.4 mVp-p

Connections:

1) Connect the Q413 base (REC AFM) of the AU-51 board and GND (TP404) via a ceramic capacitor (0.1 µF).
2) Connect the Q543 emitter (REC ATF) and the collector (GND) on the VS-37 board using a jumper wire.

Adjustment method:

1) Adjust each RV so that the output waveforms of 1a, 1b, 2a, and 2b become 20.0 ± 1.4 mVp-p.

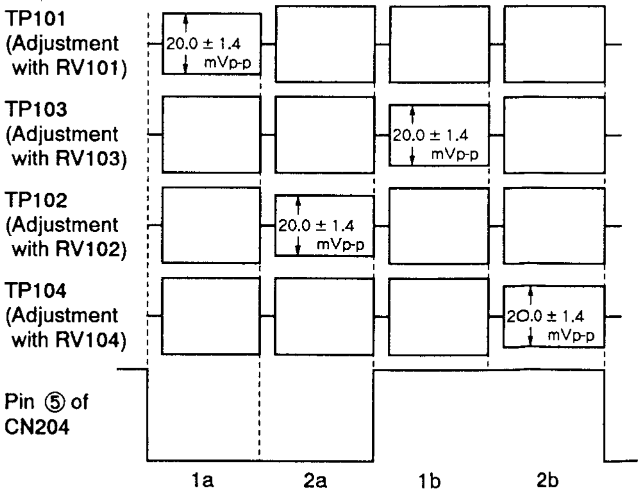

TP101 (Adjustment with RV101)
20.0 ± 1.4 mVp-p
TP103 (Adjustment with RV103)
20.0 ± 1.4 mVp-p
TP102 (Adjustment with RV102)
20.0 ± 1.4 mVp-p
TP104 (Adjustment with RV104)
20.0 ± 1.4 mVp-p
Pin ⑤ of CN204
1a
2a
1b
2b

Fig. 9-26. REC C current adjustment

9-5-16. REC ATF Current Check (VS-37 Board)

Mode	Recording (SP mode)
Signal	No signal
Measurement Point	TP101 (1a) TP103 (1b) TP102 (2a) TP104 (2b)
Measuring Instrument	Oscilloscope (1:1 probe)
Specified Value	5.5 ± 1.5 mVp-p (1a) 5.0 ± 1.5 mVp-p (1b) 5.5 ± 1.5 mVp-p (2a) 5.5 ± 1.5 mVp-p (2b)

Connection:

1) Connect the Q413 base (REC AFM) on the AU-51 board and GND (TP404) via a ceramic capacitor (0.1 μF).

Checking method:

1) Trigger a 9.9 μsec (1 cycle) waveform superposed to the output waveform of TP101 (1a), and confirm that the waveform level is 5.5 ± 1.5 mVp-p.
2) Trigger a 6.1 μsec (1 cycle) waveform superposed to the output waveform of TP103 (1b), and confirm that the waveform level is 5.0 ± 1.5 mVp-p.
3) Trigger a 8.5 μsec (1 cycle) waveform superposed to the output waveform of TP102 (2a), and confirm that the waveform level is 5.5 ± 1.5 mVp-p.
4) Trigger a 6.8 μsec (1 cycle) waveform superposed to the output waveform of TP104 (2b), and confirm that the waveform level is 5.5 ± 1.5 mVp-p.

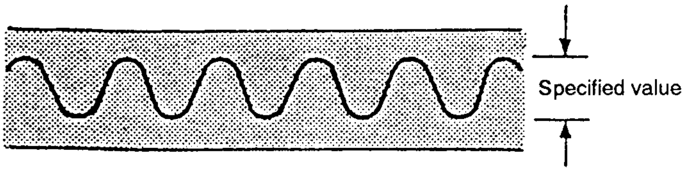


Fig. 9-27. REC ATF current check

9-5-17. Feedback Chroma Adjustment (PD-18 Board)

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-5CSP)
Measurement Point	Emitter of Q205
Measuring Instrument	Oscilloscope
Adjustment Element	RV201

Note: Remove the MD frame assembly to perform adjustments.

Adjusting method:

1) Adjust RV201 so as to mininize the residual chroma component.

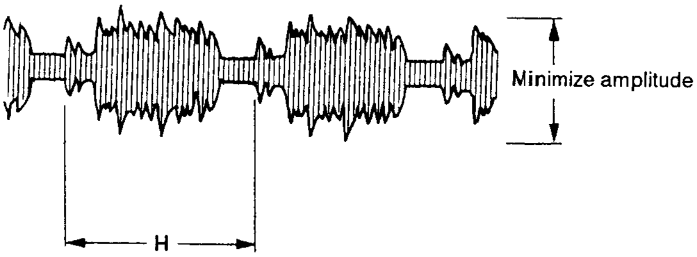


Fig. 9-28.

9-5-18. Quasi Burst Phase Adjustment (VS-37 Board)

1. Method using vectorscope

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-5CSP)
Measurement Point	J901 (VIDEO OUT)
Measuring Instrument	Vectorscope
Adjusting Element	RV212
Specified Value	Phase of color luminance points in quasi burst mode is same as phase of color luminance points in through burst mode

Adjusting method:

1) Memorize of the phase of the color luminance points (especially yellow). (Through burst mode)
2) Connect cathode of D216 and Pin ② of CN201 with a diode (1SS119, etc.). (Quasi burst mode)

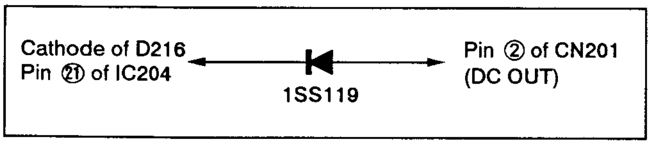


Fig. 9-29.

3) Confirm the color of color bars on the monitor screen. If abnormal, stop the unit and then set the playback mode again.
4) Adjust RV212 so that the phase of the color luminance points is the same as the phase memorized in 1).
5) Remove the diode.

2. Method using monitor TV

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-5CSP)
Measurement Point	Confirmation on monitor TV screen
Measuring Instrument	
Adjusting Element	RV212
Specified Value	Minimum chroma flickering

Connection:

1) Connect cathode of D216 and Pin ② of CN201 using a diode (1SS119, etc.).

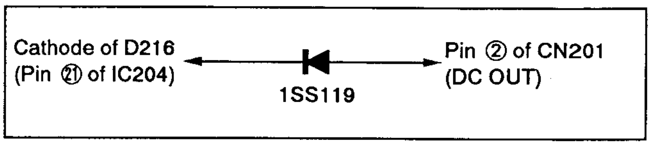


Fig. 9-30.

Adjusting method:

1) Observe the monitor screen. If color is abnormal, stop the unit and then set the playback mode again.
2) Set the monitor color level to maximum and its bright level to minimum.
3) Rotate RV212 fully in the counterclockwise direction(↺).
4) Turn RV212 slowly clockwise and stop where chroma flicker is minimum and horizontal black stripes are least visible.
5) Remove the diode.

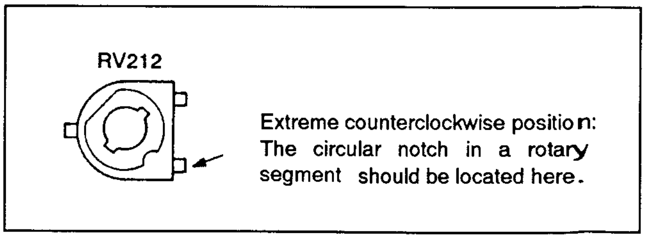

RV212
Extreme counterclockwise position:
The circular notch in a rotary segment should be located here.

Fig. 9-31.

9-5-19. Delay Burst Phase Adjustment (VS-37 Board)

Mode	Playback pause (LP mode)
Signal	Alignment tape: For operation checking (WR5-4CL) color bars
Measurement Point	Confirmation on monitor TV screen
Measuring Instrument	
Adjusting Element	RV213
Specified Value	Minimum chroma flickering

Adjusting method:

1) Set the monitor TV color level to maximum and its bright level to minimum.
2) Minimize chroma flicker with RV213 so that horizontal black stripes cannot longer be seen.

9-6. AUDIO SYSTEM ADJUSTMENT

- Perform adjustment with the color bar signal used as the video input signal.

[Connection of audio measuring instruments]
In addition to the video system measuring instruments, connect the audio system measuring instruments as shown in the figure below, and set the power switch to the video position for adjustment.

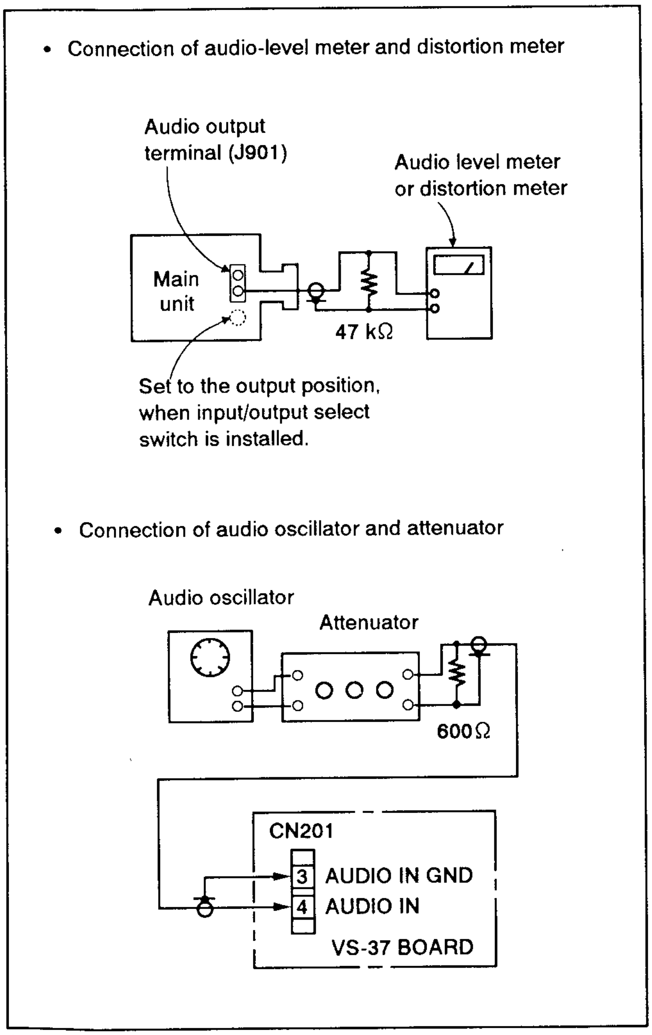

• Connection of audio-level meter and distortion meter
Audio output terminal (J901)
Audio level meter or distortion meter
Main unit
47 kΩ
Set to the output position, when input/output select switch is installed.
• Connection of audio oscillator and attenuator
Audio oscillator
Attenuator
600Ω
CN201
3 AUDIO IN GND
4 AUDIO IN
VS-37 BOARD

Fig. 9-32.

9-6-1. AFM Carrier Frequency Adjustment (AU-51 Board)

Mode	Recording
Signal	Non-signal
Measurement Point	Pin ⑬ of IC401(REC AFM) (JL419)
Measuring Instrument	Frequency counter
Adjusting Element	RV401
Specified Value	1.508 ± 0.002 MHz

Note: Connect the frequency counter through a buffer amplifier (oscilloscope, etc.) having high impedance and low capacitance.

Adjustment method:
1) Turn OFF the audio oscillator output.
2) Adjust the AFM carrier frequency is 1.508 ± 0.002 MHz using RV401.

9-6-2. REC AFM Carrier Level Check (AU-51 Board)

Mode	Recording
Signal	Non-signal
Measurement Point	Pin ⑧ of CN401 (REC AFM)
Measuring Instrument	Oscilloscope
Specified Value	68 ± 12 mVp-p

Checking method:
1) Confirm that the level is 68 ± 12 mVp-p.

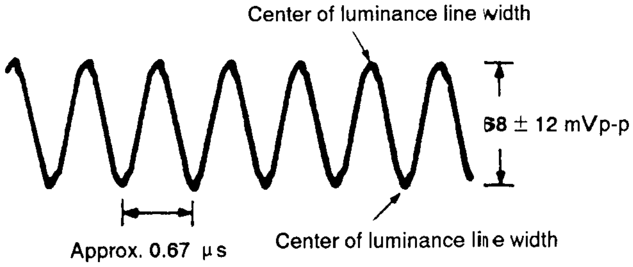

Center of luminance line width
68 ± 12 mVp-p
Approx. 0.67 μs
Center of luminance line width

Fig. 9-33. REC AFM carrier level

9-6-3. AFM Deviation Adjustment (AU-51 Board)

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-5CSP)
Measurement Point	Audio output terminal (J901)
Measuring Instrument	Audio level meter
Adjusting Element	RV402
Specified Value	-7.5 ± 0.2 dBs

Checking method:
1) Adjust the audio output level is -7.5 ± 0.2 dBs.

9-6-4. E-E Output Level Check

Mode	E-E
Signal	400 Hz, –7.5 dBs
Measurement Point	Audio output terminal (J901)
Measuring Instrument	Audio level meter
Specified Value	–7.5 ± 2 dBs

Checking method:

1) Make sure that the audio output level is –7.5 ± 2 dBs.

9-6-5. Overall Level Characteristics Check

Mode	Self-recording and playback
Signal	400 Hz, –7.5 dBs
Measurement Point	Audio output terminal (J901)
Measuring Instrument	Audio level meter
Specified Value	–7.5 ± 3 dBs

Checking method:

1) Record the signal.
2) Playback the recorded section.
3) Make sure that the audio output level is –7.5 ± 3 dBs.

9-6-6. Overall Frequency Characteristics Check

Mode	Self-recording and playback
Signal	Ⓐ 400 Hz, –17.5 dBs Ⓑ 30 Hz, –17.5 dBs Ⓒ 14 Hz, –17.5 dBs
Measurement Point	Audio output terminal (J901)
Measuring Instrument	Audio level meter
Specified Value	With the 400 Hz playback output level as 0 dB, the playback output level of 30 Hz and 14 kHz is 0 ± 3 dB

Checking method:

1) Record signal Ⓐ through Ⓒ in order.
2) Playback the recorded sections.
3) With the 400 Hz playback output level as 0 dB, confirm that the playback output level of 30 Hz and 14 kHz is 0 ± 3 dB.

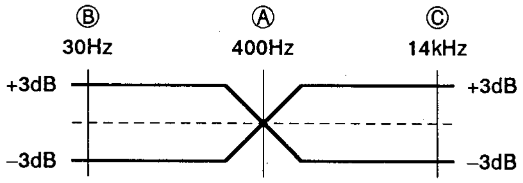


Fig. 9-34. AFM overall frequency characteristics

9-6-7. Overall Distortion Check

Mode	Self recording and playback
Signal	400 Hz, –7.5 dBs
Measurement Point	Audio output terminal (J901)
Measuring Instrument	Distortion meter
Specified Value	Less than 0.5% *1

Checking method:

1) Record the signal.
2) Playback the recorded section.
3) Confirm that the distortion is less than 0.5%. *1

*1 Value when 200 Hz – 6 kHz 18dB/oct BPF is used.
When the filter is not used .... less than 1.0%

9-6-8. Overall Noise Level Check

Mode	Self-recording and playback
Signal	No signal (shorting plug is inserted into audio input jack)
Measurement Point	Audio output terminal (J901)
Measuring Instrument	Audio level meter
Specified Value	Less than – 67.5 dBs*2

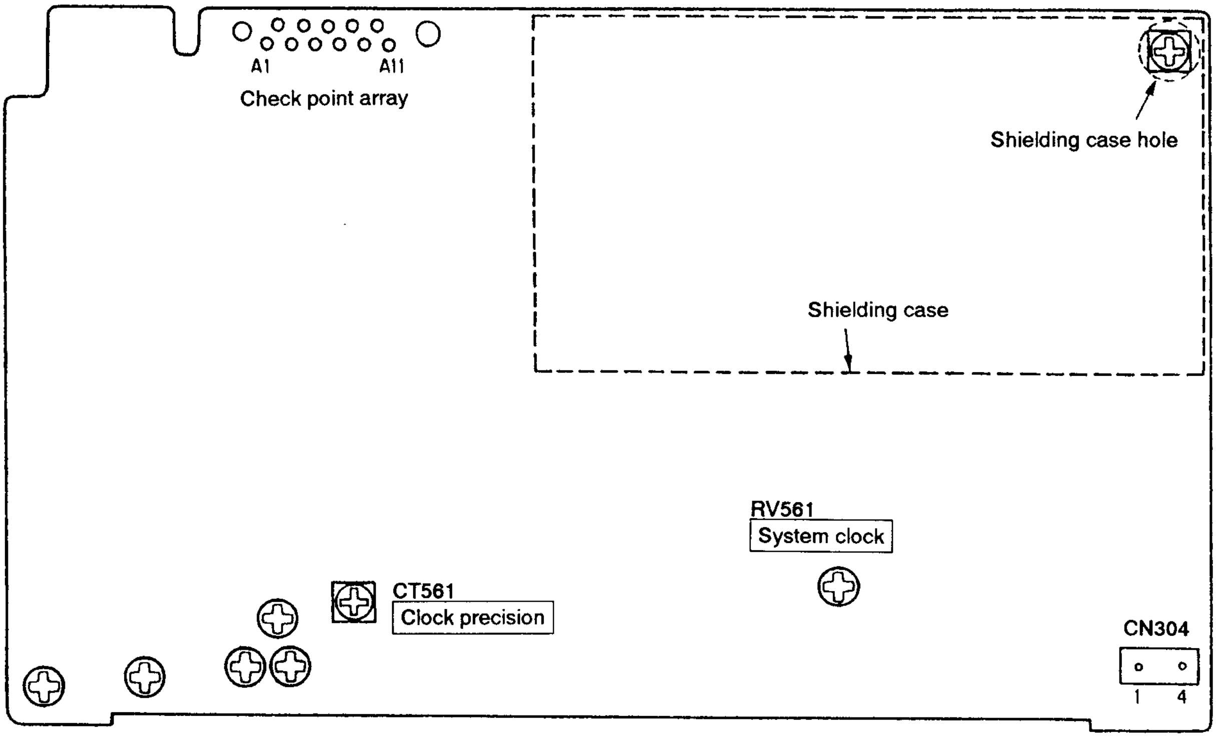
Checking method:

1) Record the signal.
2) Playback the recorded section.
3) Make sure that the noise level is less than –67.5 dBs. *2

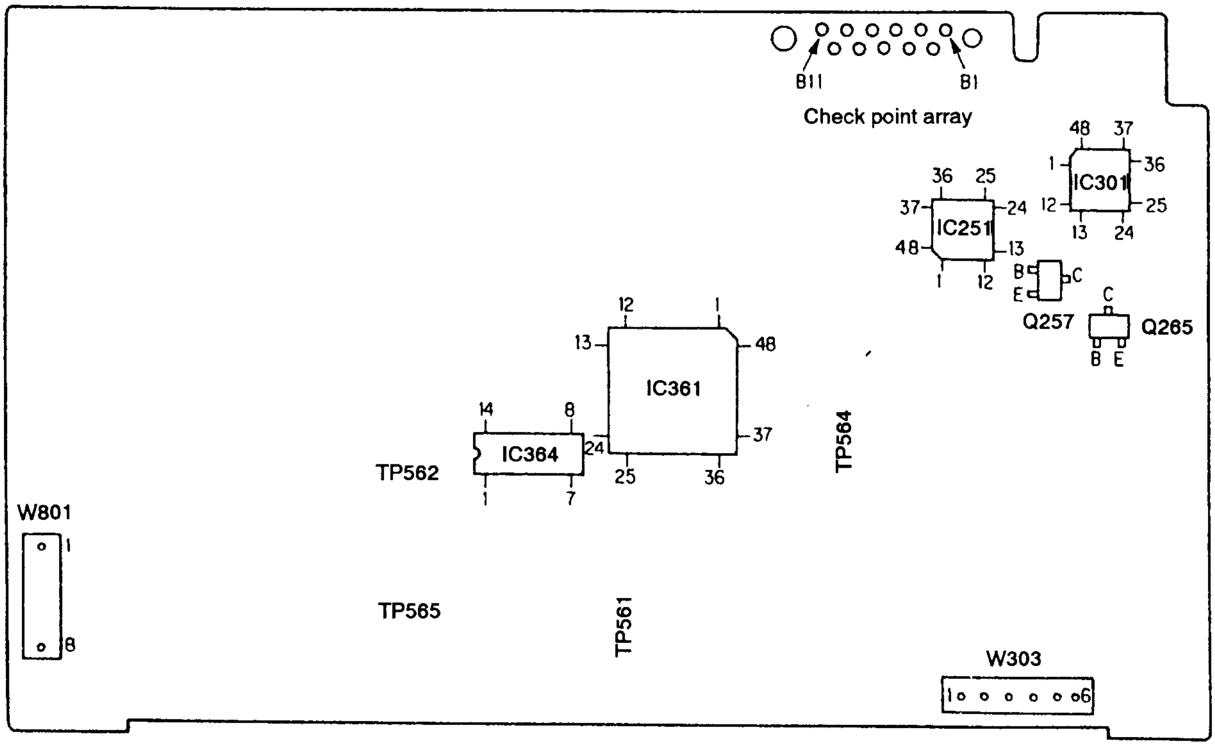
*2 Value when IHF-A hearing correction filter is used.

9-7. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

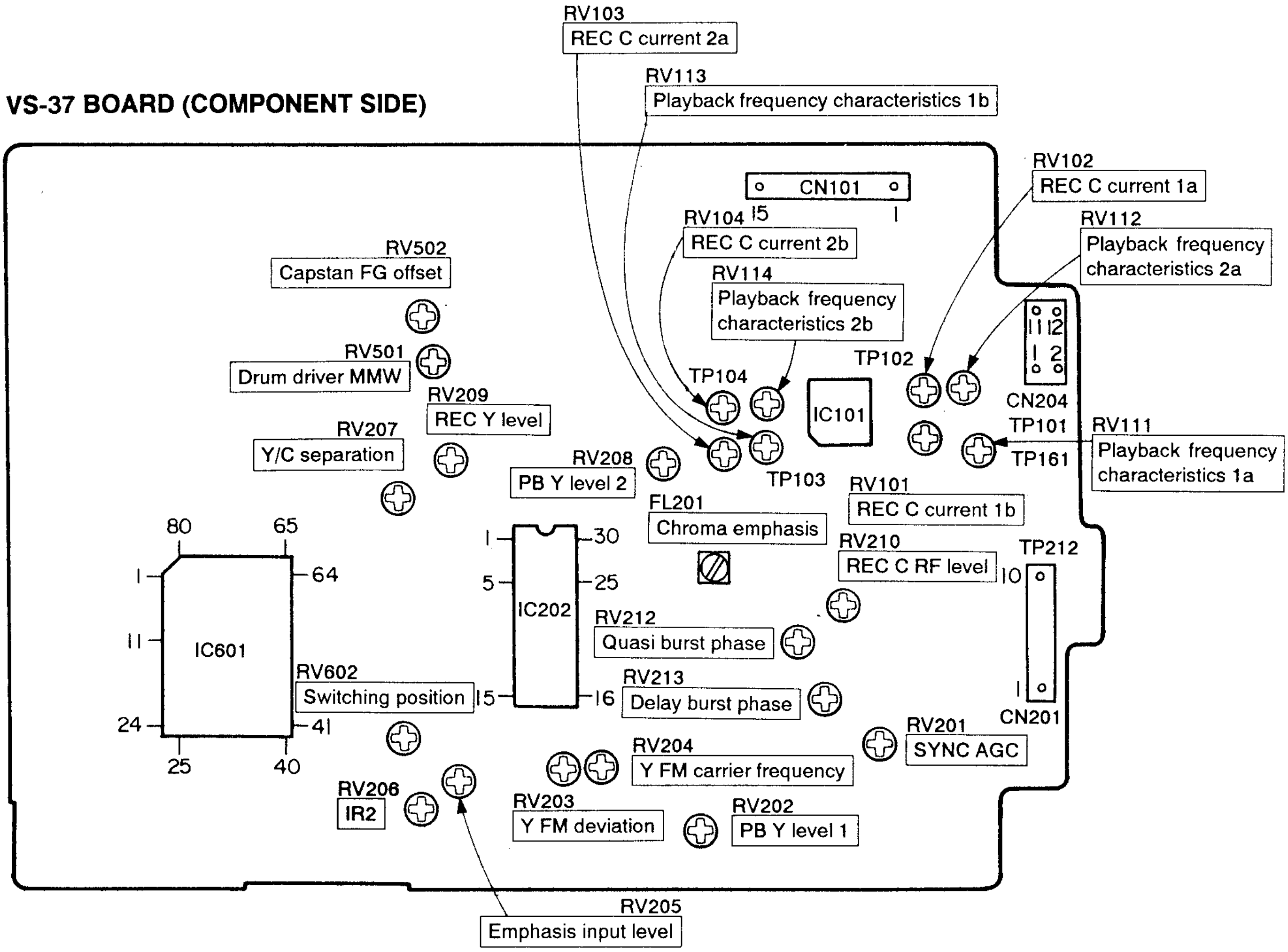
VC-60 BOARD (COMPONENT SIDE)


A1
A11
Check point array
Shielding case hole
Shielding case
RV561
System clock
CT561
Clock precision
CN304
1
4

VC-60 BOARD (CONDUCTOR SIDE)

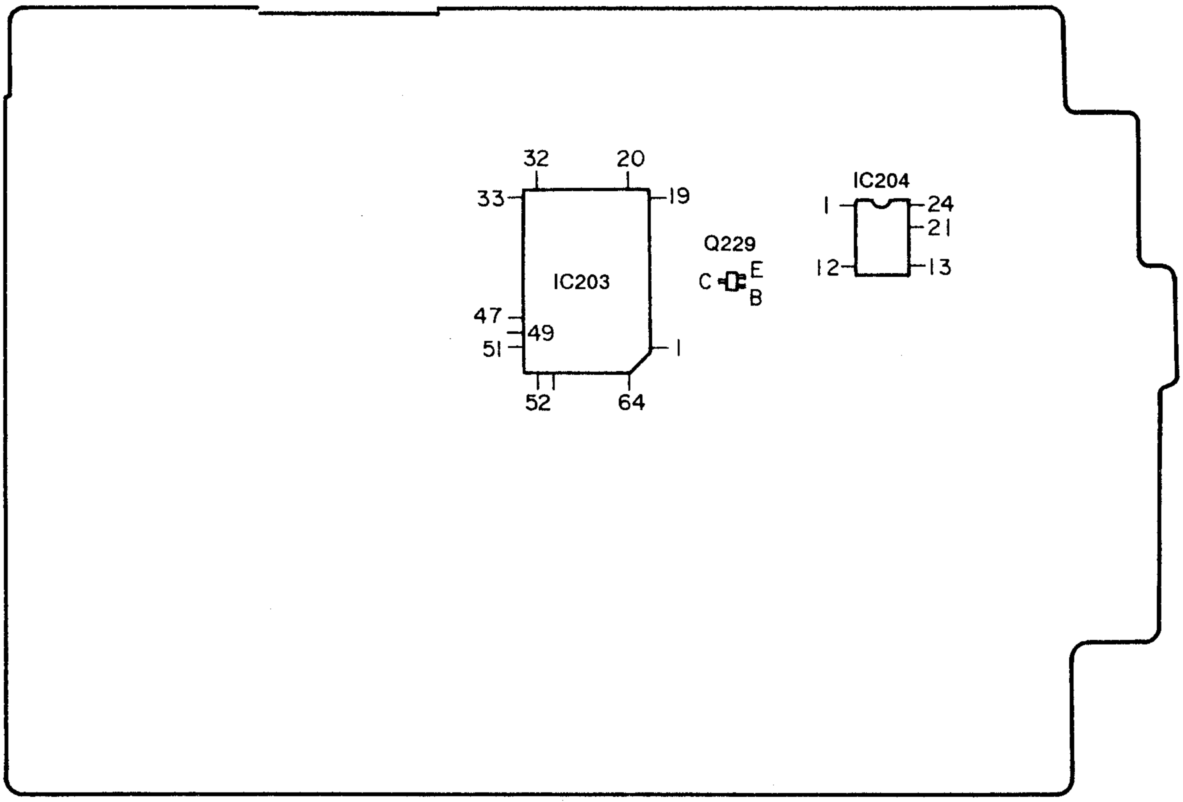

B11
B1
Check point array
48
37
1
36
IC301
12
25
13
24
36
25
37
24
IC251
48
13
1
12
B
C
E
Q257
C
Q265
B E
12
1
13
48
IC361
14
8
37
IC364
24
TP562
1
7
25
36
TP564
W801
1
8
TP565
TP561
W303
1
6

VS-37 BOARD (COMPONENT SIDE)



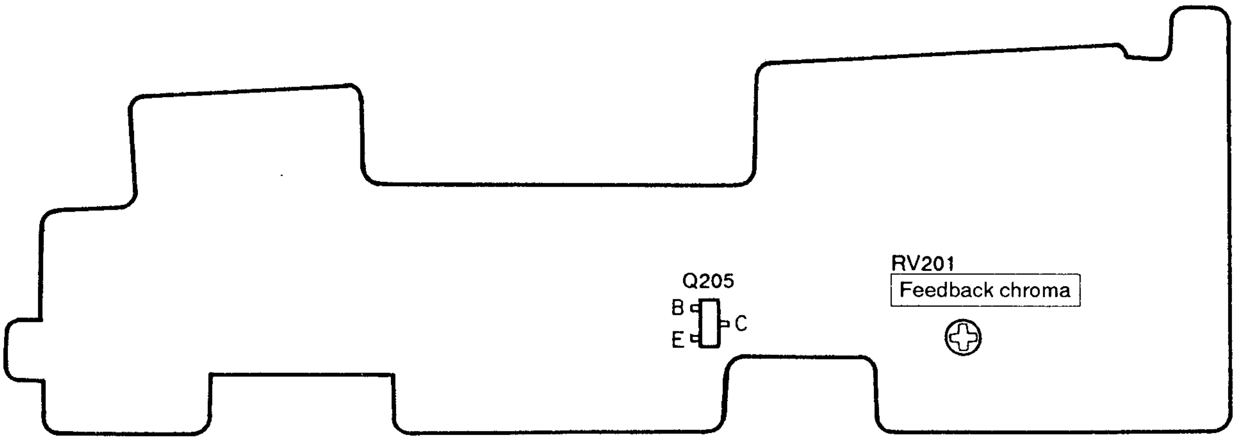
RV103
REC C current 2a
RV113
Playback frequency characteristics 1b
CN101
15
1
RV102
REC C current 1a
RV104
REC C current 2b
RV112
Playback frequency characteristics 2a
RV502
Capstan FG offset
RV114
Playback frequency characteristics 2b
RV501
Drum driver MMW
TP102
11 12
1 2
TP104
IC101
RV209
REC Y level
CN204
TP101
RV111
RV207
Y/C separation
Playback frequency characteristics 1a
TP161
RV208
PB Y level 2
TP103
RV101
REC C current 1b
FL201
Chroma emphasis
80
65
1
30
RV210
REC C RF level
TP212
1
64
5
25
10
IC202
RV212
11
IC601
Quasi burst phase
RV602
RV213
Switching position
15
16
Delay burst phase
1
24
41
CN201
RV201
SYNC AGC
25
40
RV204
Y FM carrier frequency
RV206
IR2
RV203
Y FM deviation
RV202
PB Y level 1
RV205
Emphasis input level

VS-37 BOARD (CONDUCTOR SIDE)

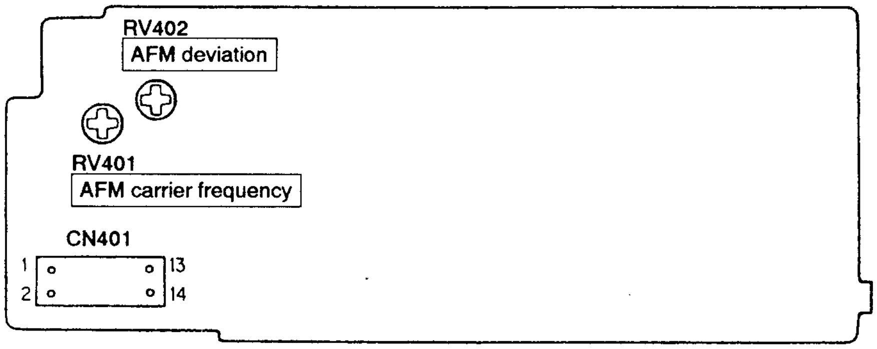


32
20
IC204
33
19
1
24
21
Q229
12
13
IC203
C
E
B
47
49
51
1
52
64

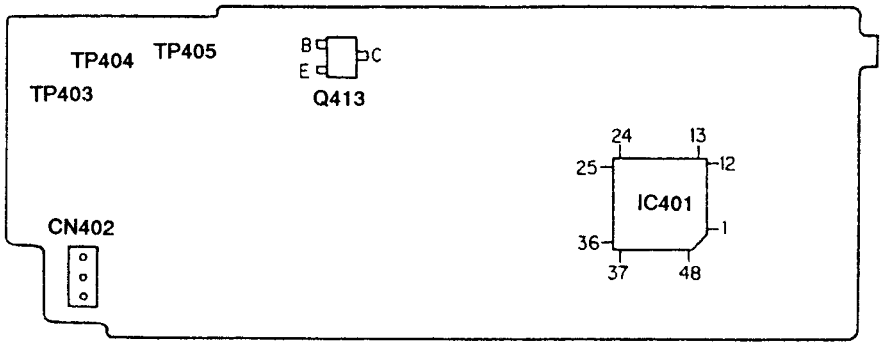
PD-18 BOARD (COMPONENT SIDE)


Q205
B
E
C
RV201
Feedback chroma

AU-51 BOARD (COMPONENT SIDE)


RV402
AFM deviation
RV401
AFM carrier frequency
CN401
1
2
13
14

AU-51 BOARD (CONDUCTOR SIDE)


TP404
TP405
TP403
B
E
C
Q413
24
13
25
12
IC401
36
1
37
48
CN402

CCD-TR55E

SONY
SERVICE MANUAL

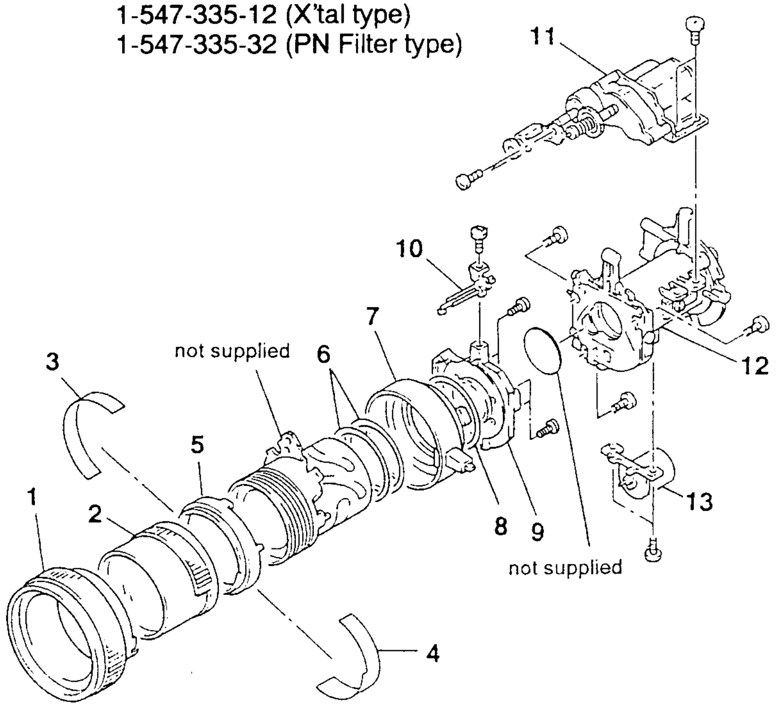
AEP Model
UK Model
Australian Model
E Model

SUPPLEMENT-2

File this supplement with the service manual.

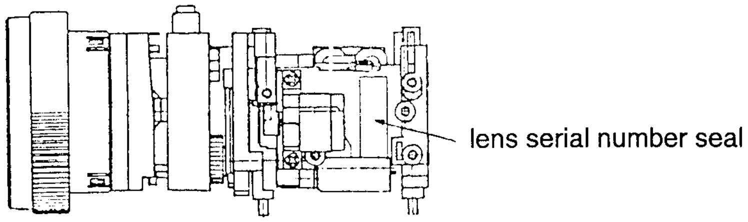
1. Each part of zoom lens assy listed below are available.

Zoom Lens Assy (VCL-1106XA)
1-547-335-12 (X'tal type)
1-547-335-32 (PN Filter type)



No.	Part No.	Description	Remark
1	3-707-740-01	RING	
2	3-707-661-01	F RING UNIT	
3	3-707-658-01	DISTANCE SCALE SUPPORT TAPE	
4	3-707-657-01	DISTANCE SCALE FITTING TAPE	
5	3-707-656-01	F SCALE RING	
6	3-707-744-01	LOWER COVER	
7	3-707-745-01	ZOOM RING ASSY	
8	3-707-743-01	WASHER	
9	3-707-741-01	MIDWAY FRAME ASSY	
10	3-707-662-01	LEAR SWITCH ASSY	
11	3-707-659-01	AF ZOOM MOTOR ASSY	
12	3-707-742-01	REAR ASSY	
13	3-707-660-01	EE METER ASSY	

2. Distinction



Lens Ass'y	Seal Color
X'tal Type 1-547-335-12	White Greenish Brown
PN Filter Type 1-547-335-32	Cream

9-972-846-82

Sony Corporation
Personal Video Group

English
90J0970-1
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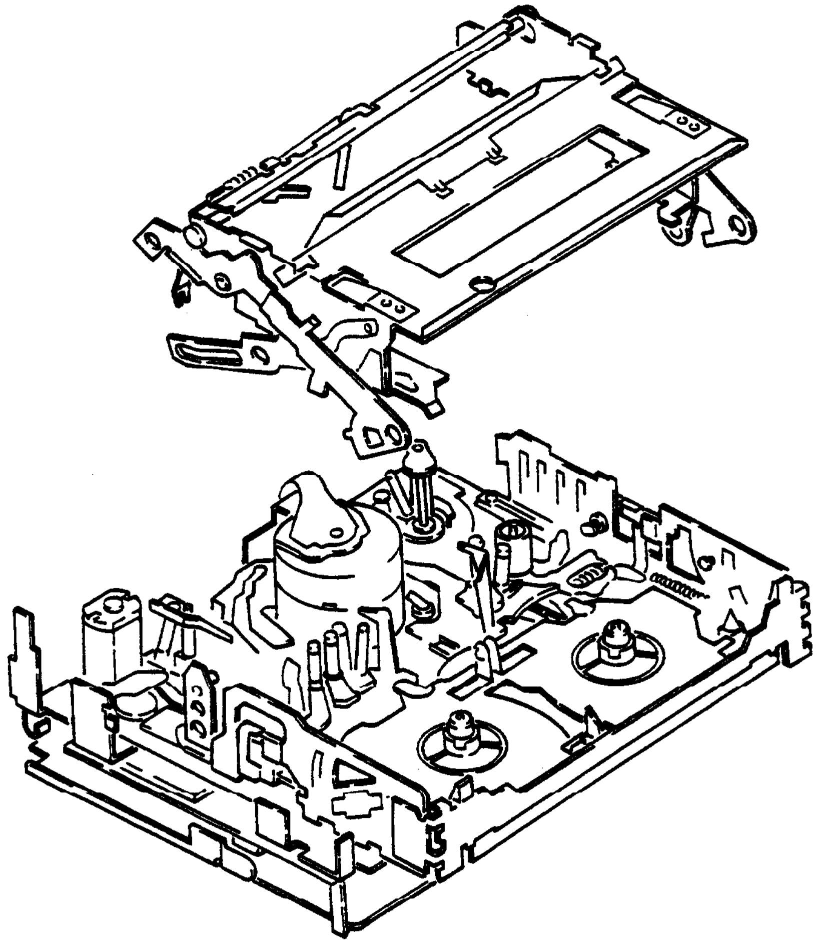
8mm Video MECHANICAL ADJUSTMENT MANUAL II

FL MECHANISM (Q MECHANISM) Video 8

File with the SERVICE MANUAL



8 VIDEO RECORDER

SONY®

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1. PREPARATION FOR MECHANICAL CHECK, ADJUSTMENT AND MAINTENANCE

For removal of the cabinet and boards, refer to "Disassembly" in each Service Manual.

Mechanical adjustment is done in the USE mode. (To select the USE mode, refer to "1-4 Handling of Mode Selector".)

1-1 CASSETTE COMPARTMENT HOLDER ASSEMBLY (Fig. 1)

1. Removal

1) Select the USE mode.
2) Remove the screw ●, and then, the LS support ●.
3) Remove the four screws ●, and then, the LS frame assy ●.
4) Remove the three lock washers ●, and then, the washer ●, bar, joint ●, T protector assy ●, and TP arm assy ● in that order.
5) Remove the two screws●, and then, the two arm shafts A●.
6) Remove the shaft through the long hole●. With the cassette compartment holder assembly●rotated in a direction of the arrowⒶ, remove the long holes●and●from the shaft in that order, and then, remove the cassette compartment holder assembly●.
7) Slide the BS holder●in a direction of the arrowⒷ as shown in Fig. A and remove it in a direction of the arrowⒸ.

Note : When this is done, be careful not to drop the steel ball and spring, compression out of the BS holder ●.

2. Mounting

1) Select the USE mode.
2) Mount the BS holder●in the reverse order of its removal. Note: Refer to Fig. A.
3) Mount the shafts in the order of the long holes ●, ●and● of the cassette compartment holder assembly●, respectively.

Note : When this is done. rotate the cassette compartment holder assembly●in a direction of the arrowⒶ to mount it until the long hole is aligned with the oval shape of the shaft.

4) Align the oval shape of the two arm shafts A●with the long holes of the LS chassis, fit them in firmly and fix with the two screws●.
5) Mount the TP arm assy ●, T protector assy ● and bar, joint ●, respectively. Then, mount the washer ● and three lock washers ●.
6) Mount the LS frame assy ● to the chassis and fix with the four screws ●.
7) Mount the LS support ● to the chassis and fix with the screw ●.

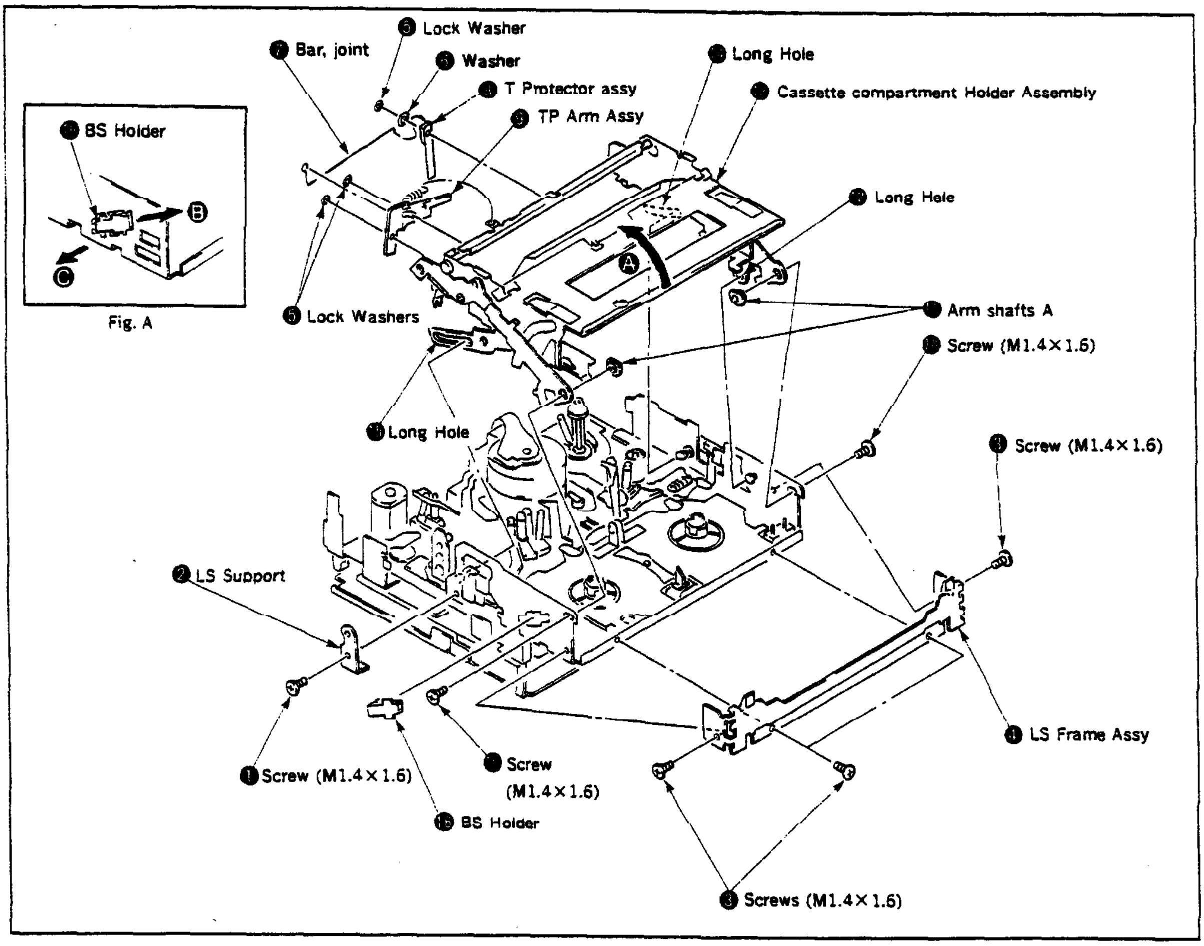

● BS Holder
Ⓑ
Ⓒ
Fig. A
● Lock Washer
● Bar, joint
● Washer
● T Protector assy
● TP Arm Assy
● Long Hole
● Cassette compartment Holder Assembly
● Long Hole
Ⓐ
● Lock Washers
● Arm shafts A
● Screw (M1.4×1.6)
● Long Hole
● Screw (M1.4×1.6)
● LS Support
● LS Frame Assy
● Screw (M1.4×1.6)
● Screw (M1.4×1.6)
● BS Holder
● Screws (M1.4×1.6)

Fig. 1

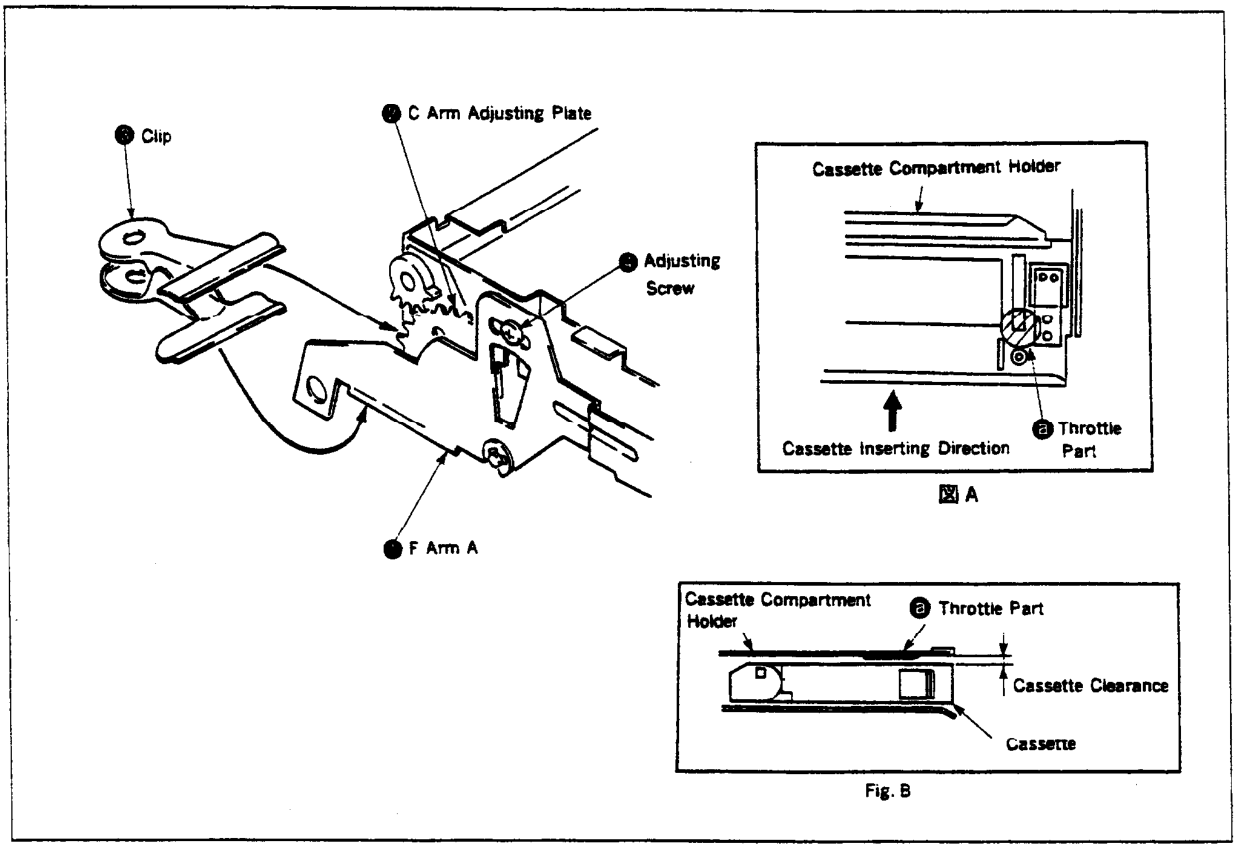
1-2 CASSETTE COMPARTMENT LOCK HEIGHT ADJUSTMENT (Fig. 2)

1) Using a spacer, etc., insert a 15.3mm-thick cassette to lock the cassette compartment.

Note : As shown in Fig. A, a 15.3mm-thick portion may be under the throttle partⓐ.

2) Pressing the partⓐ, nip the F arm A ● and the first tooth of the C arm adjusting plate ● with the clip ●, and tighten the adjusting screw ● at a torque of 1kg•cm.

3) Apply Screw Lock to the adjusting screw ● after making sure of the following clearances between the throttle partⓐ of the cassette compartment holder and the cassette as shown in Fig. B.
   - For 15mm-thick dummy cassette : 0.5 − 0.9
   - For 15.2mm-thick dummy cassette : 0.3 − 0.7


● Clip
● C Arm Adjusting Plate
● Adjusting Screw
● F Arm A
Cassette Compartment Holder
Cassette Inserting Direction
ⓐ Throttle Part
Cassette Compartment Holder
ⓐ Throttle Part
Cassette Clearance
Cassette

図A

Fig. B

Fig. 2

1-3 OPERATION WITH CASSETTE COMPARTMENT HOLDER ASSEMBLY REMOVED

1. Putting into Loading state (Fig. 3)

1) Referring to the Service Manual, supply power with the cabinet and camera section removed. (Make the mechanism deck ready to operate.)
2) Place the cap ● on the LED assembly ●.
3) Press the pin of the push switch ● (ON state) and fix it with adhesive tape ● in that state.
4) Press the locking plate release arm ● in an arrow direction. The set is made ready for loading.

2. Putting into the REC Mode

1) Short the TEST pins (SS-82 board CN404 pins ● and ● for CCD-V11/V88) to place into the TEST mode.

For CCD-V11/V88 ; SS-82 board CN404
TEST pin connector

4	GND
3	$\overline{\text{CAM ADJ}}$
2	$\overline{\text{TEST}}$
1	$\overline{\text{PATH}}$

The set is placed into the TEST mode by shorting the pins ● and ●.

2) After completing the step 1), set the power switch to VTR (or CAMERA).
3) Turn on the REC switch. (If the set is placed in the TEST mode, detection of S and T reel table rotation is disabled and the tape can run.)

3. Putting into EJECT

1) Turn on the EJECT switch.

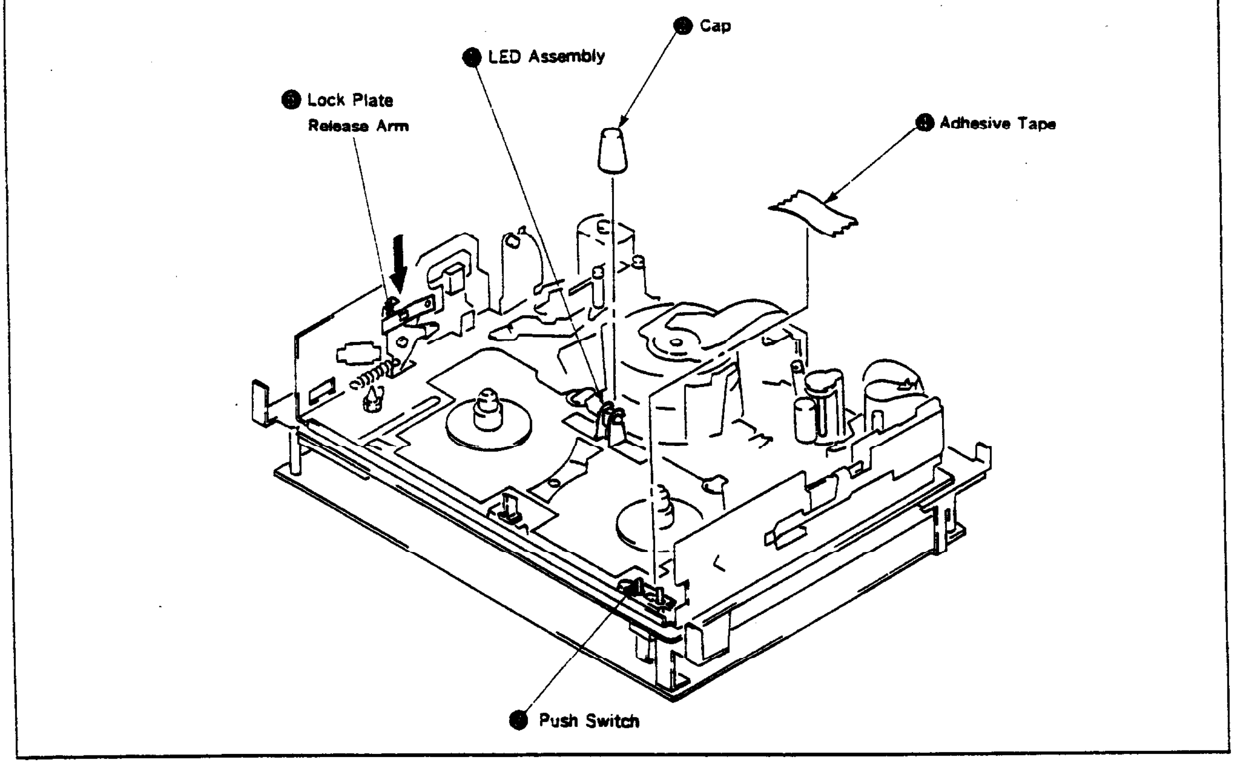


Fig. 3

1-4 HANDLING OF MODE SELECTOR

- Mount the MODE SELECTOR III panel to the mode selector. U, FL, O and O' mechanisms have different mode indications respectively. Select your disired type. (Fig. 4)

1. Construction (Fig. 5)

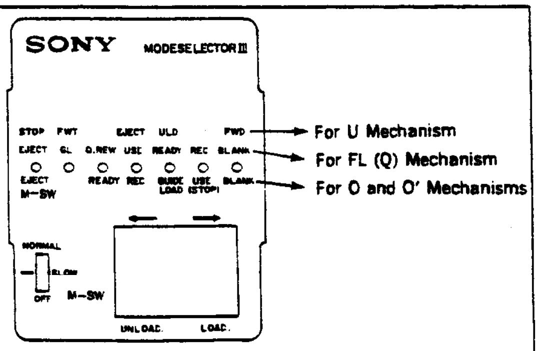
2. Connection (Fig. 6)

For CCD-VII/V88

1) Remove the plate, ornamental ●.
2) Remove the screw ●, and then, the LB-12 board ●.
3) Remove the FP-114 flexible connector ● and loading motor connector ●, and insert them into the MODE SELECTOR III conversion connector respectively.
4) Insert the M-SW connector of the mode selector into the MODE SELECTOR III conversion connector.

3. Handling

1) Use the M mode selector buttons only.
2) During mode selection, "BLANK" lights up when no mode is being selected.
3) If the right M mode selector button is kept pressed, EJECT, USE, GL, Q.REW, GL, REC and READY light up in that order.
4) When changing over from the READY mode back to the EJECT mode, press the left M mode selector button to select your desired mode.


SONY
MODESELECTOR III
STOP FWT EJECT ULD FWD
EJECT GL Q.REW USE READY REC BLANK
EJECT READY REC GUIDE LOAD USE (STOP) BLANK
M-SW
NORMAL
SLOW
OFF
M-SW
UNLOAD.
LOAD.
For U Mechanism
For FL (Q) Mechanism
For O and O' Mechanisms

Ref. No. J-13 MODE SELECTOR III Panel

Fig. 4

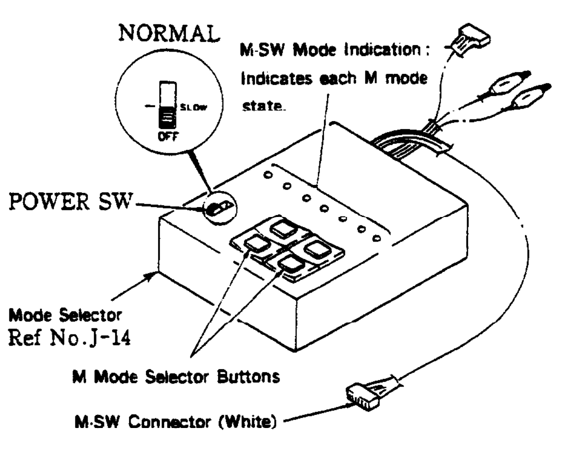

NORMAL
M-SW Mode Indication : Indicates each M mode state.
SLOW
OFF
POWER SW
Mode Selector
Ref No.J-14
M Mode Selector Buttons
M-SW Connector (White)

Fig. 5

For CCD-V11/V88

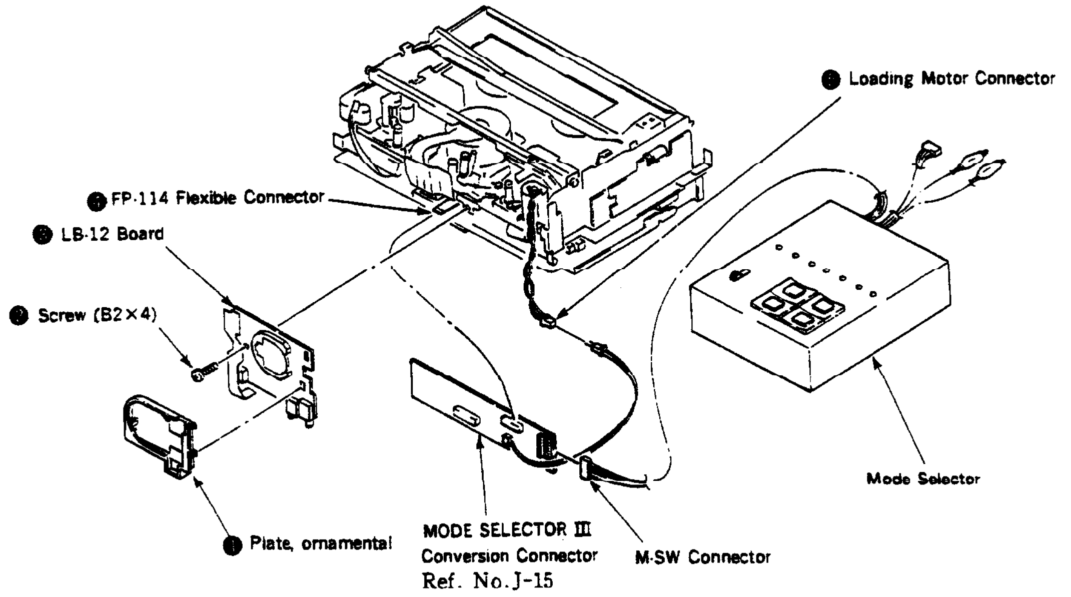
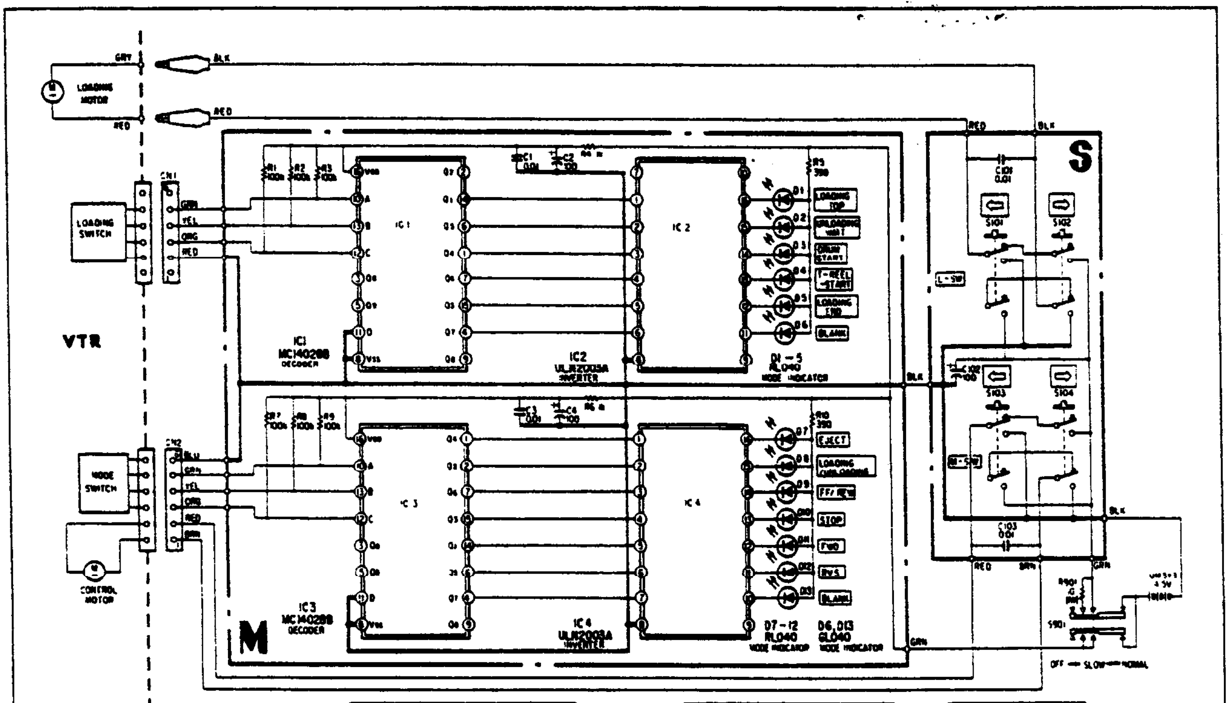

● Loading Motor Connector
● FP-114 Flexible Connector
● LB-12 Board
● Screw (B2×4)
● Plate, ornamental
MODE SELECTOR III
Conversion Connector
Ref. No.J-15
M-SW Connector
Mode Selector

Fig. 6

1-5 MODE SELECTOR SCHEMATIC DIAGRAM


LOADING MOTOR
GRY
BLK
RED
CN1
LOADING SWITCH
GRN
YEL
ORG
RED
VTR
CN2
MODE SWITCH
BLU
CONTROL MOTOR
IC1 MC14028B DECODER
IC2 ULN2003A INVERTER
D1-5 RL040 MODE INDICATOR
IC3 MC14028B DECODER
IC4 ULN2003A INVERTER
D7-12 RL040 MODE INDICATOR
D6, D13 GL040 MODE INDICATOR
LOADING TOP
UNLOADING WAIT
DRUM START
T-REEL START
LOADING END
BLANK
EJECT
LOADING UNLOADING
FF/REW
STOP
FWD
RVS
BLANK
S
M
L-SW
M-SW
S101
S102
S103
S104
C101 0.01
C102 100
C103 0.01
R901
S901
OFF — SLOW — NORMAL

M-SW (IC 3)

DECODER INPUT C	B	A	MODE	LED NO
0	0	0		
0	0	1	FWD	D11
0	1	0	LOADING/UNLOADING	D8
0	1	1	STOP	D10
1	0	0	EJECT	D7
1	0	1	RVS	D12
1	1	0	FF/REW	D9
1	1	1	BLANK	D13

0: INPUT LEVEL L
1: INPUT LEVEL H

L-SW (IC 1)

DECODER INPUT C	B	A	MODE	LED NO
0	0	0		
0	0	1	LOADING TOP	D1
0	1	0		
0	1	1	LOADING END	D5
1	0	0	DRUM START	D3
1	0	1	UNLOADING WAIT	D2
1	1	0	T-REEL-START	D4
1	1	1	BLANK	D6

SWITCH ⇦	⇨	DIRECTION OF MOTOR REVOLUTION
OFF	OFF	STOP
ON	OFF	⇦
OFF	ON	⇨

⇦ L-SW LOADING END → LOADING TOP
M-SW RVS → EJECT

⇨ L-SW LOADING TOP → LOADING END
M-SW EJECT → RVS

1-6 MODE SELECTOR PARTS LIST

Ref. No	Part No.	Description			
		CAPACITOR			
C1	1-108-579-00	MILER	0.01μF	50V	
C2	1-123-333-00	ELECT	100μF	24V	
C3	1-108-579-00	MILER	0.01μF	50V	
C4	1-123-333-00	ELECT	100μF	24V	
C101	1-108-579-00	MILER	0.01μF	50V	
C102	1-123-333-00	ELECT	100μF	24V	
C103	1-108-579-00	MILER	0.01μF	50V	
		DIODE			
D1	8-719-812-31	DIODE TLR123			
D2	8-719-812-31	DIODE TLR123			
D3	8-719-812-31	DIODE TLR123			
D4	8-719-812-31	DIODE TLR123			
D5	8-719-812-31	DIODE TLR123			
D6	8-719-812-33	DIODE TLG123A			
D7	8-719-812-31	DIODE TLR123			
D8	8-719-812-31	DIODE TLR123			
D9	8-719-812-31	DIODE TLR123			
D10	8-719-812-31	DIODE TLR123			
D11	8-719-812-31	DIODE TLR123			
D12	8-719-812-31	DIODE TLR123			
D13	8-719-812-33	DIODE TLG123A			
		IC			
IC1	8-752-240-28	IC TC4028BP			
IC2	8-752-120-03	IC μPA2003C			
IC3	8-759-240-28	IC TC4028BP			
IC4	8-759-120-03	IC μPA2003C			
		RESISTOR			
R1	1-247-179-00	CARBON	100K	1/4W	
R2	1-247-179-00	CARBON	100K	1/4W	
R3	1-247-179-00	CARBON	100K	1/4W	
R4	1-247-131-00	CARBON	1K	1/4W	
R5	1-247-121-00	CARBON	390	1/4W	
R6	1-247-131-00	CARBON	1K	1/4W	
R7	1-247-179-00	CARBON	100K	1/4W	
R8	1-247-179-00	CARBON	100K	1/4W	
R9	1-247-179-00	CARBON	100K	1/4W	
R10	1-247-121-00	CARBON	390	1/4W	
R901	1-214-594-00	METAL	10	1W	

2. PERIODIC CHECK AND MAINTENANCE

- Carry out the following maintenance and periodic checks in order not only to fully exhibit the functions and performance of the set, but also for the equipment and tape. After repairing, service the set as follows, regarless of the length of use.

2-1 CLEANING OF ROTARY DRUM ASSEMBLY

1) Gently apply chamois cloth (Ref. No. J-2) soaked in cleaning liquid (Ref. No. J-1) to the rotary drum assembly.
   Clean it by rotating the upper rotary drum assembly slowly counterclockwise by hand.

Note : Do not rotate the motor by power or rotate the upper rotary drum assembly clockwise by hand. Also, the head tip is highly likely to be damaged if the chamois cloth is moved in a pependicular direction to the it. Make sure to follow the instructions above for cleaning the rotary drum assembly.

2-2 CLEANING OF TAPE PATH (Fig. 7)

1) In the EJECT mode, clean the tape running system (TG-1, -2, -3, -4, -5, -6, -7, -8, -9, -10, -11, pinch roller, and capstan shaft) and the lower drum, using a superfine applicator (Ref. No. J-3) soaked in the cleaning liquid.

Note : Note that no oil or grease of each link mechanism adheres to the superfine applicator (Ref. No. J-3).

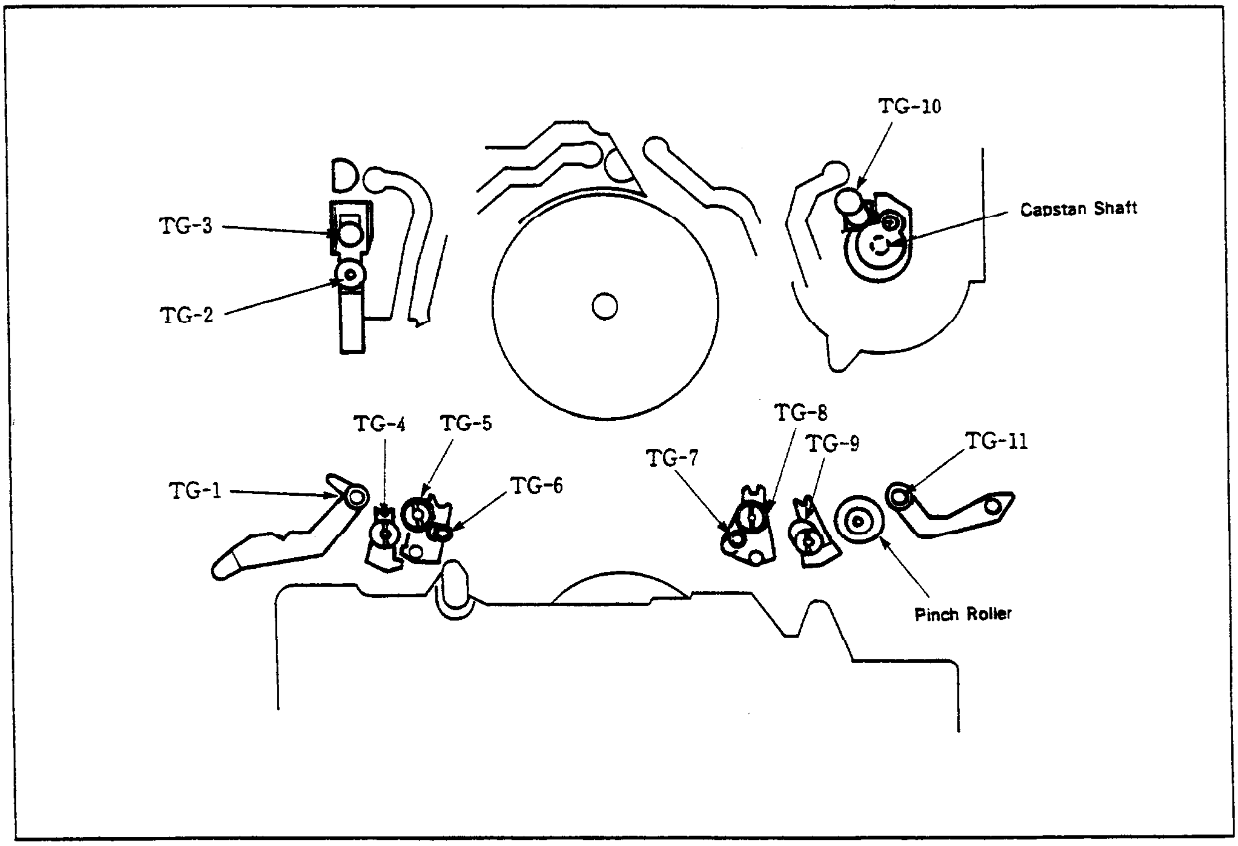


Fig. 7

2-3 PERIODIC CHECK ITEMS

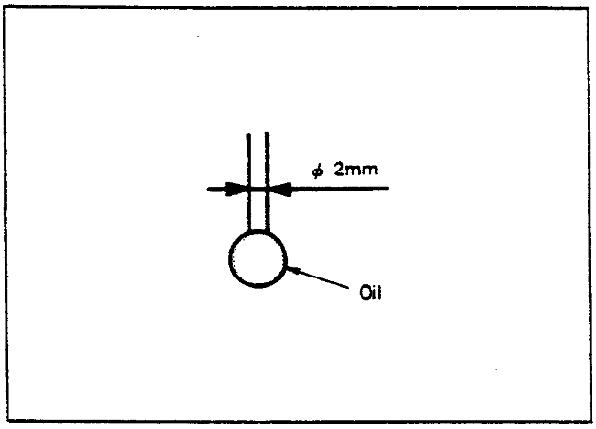
Location of Maintenance and check		Hours of Use (H)										Remarks
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	
Tape trans-portion System	Cleaning of tape path surface	○	○	○	○	○	○	○	○	○	○	Be careful of oil
	Cleaning and degaussing of rotary assembly	○	○	○	○	○	○	○	○	○	○	Be careful of oil
Driving System	Relay belt	–	☆	–	☆	–	☆	–	☆	–	☆	3-728-212-01
	Capstan shaft	–	◎	–	◎	–	◎	–	◎	–	◎	Be adsolutely careful not to get oil on the tape path surface.
	Relay pulley sheft	–	◎	–	◎	–	◎	–	◎	–	◎	
	Loading motor	–	☆	–	☆	–	☆	–	☆	–	☆	1-541-607-11
Performance Confirmation	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	–	☆	–	☆	–	☆	–	☆	–	☆	
	Brake system	–	☆	–	☆	–	☆	–	☆	–	☆	
	FWD. RVS torque measurement	–	☆	–	☆	–	☆	–	☆	–	☆	

○ : Cleaning ◎ : Oil ☆ : Confirmation

Note : When overhauling, refer to the items above to replace parts.

Note : Concerning oil

- Be sure to use specified oil. (If you use oil with different visicosity, etc., it may cause troubles.)
  Oil : Part No. 7-661-018-18 (Mitsubishi Diamond Oil Hydrofluid NT-68)
- When lubricating bearings, be sure use oil free from dust, etc. (If you use oil with dust, etc. contained, it may cause bearings to be worn out or seized.)
- A drip of oil refers to an amount attached to the tip of a ϕ 2mm stick shown in the right figure.

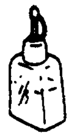


2-4 Service jigs list

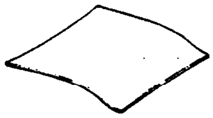
Ref. No.	Neme	Part No.	Fixture No.	Usage and Others
J-1	Cleasing fluid	Y-2031-001-0	—	
J-2	Cleasing cloth	2-034-697-00	—	
J-3	Super fine applicator (Made by NIPPON APPLICATOR, P752D)		—	
J-4	Head degausser	Widely available	—	
J-5	Small mirror for adjustment Spare mirror	J-6080-029-A J-6080-030-1	SL-5052	Tape path
J-6	Alignment tape NTSC (WR5-1N) PAL (WR5-1C)	8-967-995-01 8-967-995-06		Tape path
J-7	Dial tension gauge	J-6080-827-A		Various torque measurement
J-8	Tension measurement reel	J-6080-831-A		With ϕ30 tape
J-9	FWD and RVS winding torque cassette	J-6080-824-A	GD-2086	
J-10	Drum screwdriver (Hexagonal wrench screwdriver)	7-700-766-01		
J-11	Screwdriver for tape path	J-6082-026-A		For tape guide adjustment
J-12	Mode selector III panel	J-6082-023-A		
J-13	Mode selector	J-6080-825-A		For all models
J-14	Mode selector III conversion connector	J-6082-021-A		

Other equipment
- Oscilloscope
- Analog tester (20kΩ)

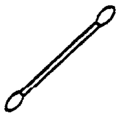
J-1



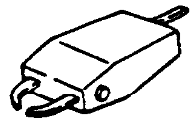
J-2



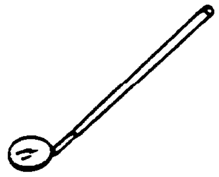
J-3



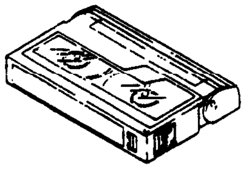
J-4



J-5



J-6



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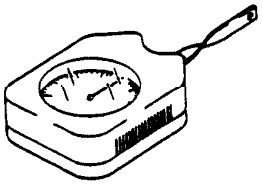

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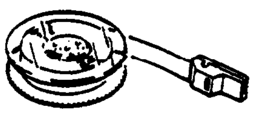
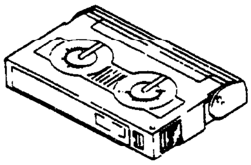
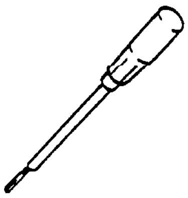


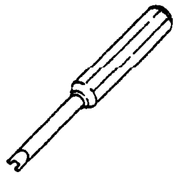
J-9



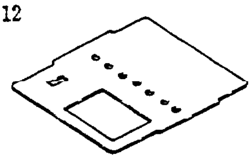
J-10



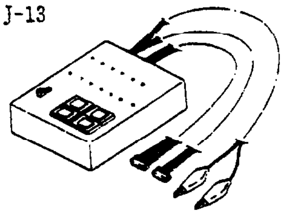
J-11



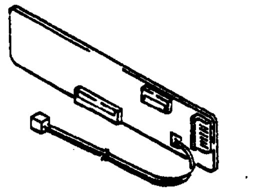
J-12



J-13



J-14



3. MECHANICAL CHECK, ADJUSTMENT AND REPLACEMENT

Note : Use the mode selector (Ref. No. J-14) for the following mechanical checks, adjustments and replacements.

Note : The modes in ☐ are those set by pressing the mode selector buttons.

3-1 LED BASE (Fig. 8)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder assembly.
3) As shown in Fig. A, rotate the LED in a direction of the arrow Ⓐ and remove it in a direction of the arrow Ⓑ.
4) Remove the three screws ❶, ❷ and ❸.
5) Lifting the LED base ❹, remove it by pushing it in a direction of the arrow Ⓒ.

Note : Dismount and remount the LED base carefully, because its holder is easily deformed.

2. Mounting

1) Select the USE mode.
2) Put the claw ❺ of the LED base ❹ in the notch ❼ of the LS chassis without catching the LED in between. Next, fit to the dowels ❻ at 2 places.
3) Mount and tighten the screws ❶, ❷ and ❸ in that order.
4) As shown in Fig. B, set the LED in a direction of the arrow Ⓐ and rotate it in a direction of the arrow Ⓑ to fix.
5) As shown in Fig. C, bend a flexible boord and put it in the holder.

Note : In the step2), make sure that the barring ❽ of the arm assy, gear can appears in the hole of the LED base. (Fig. D)

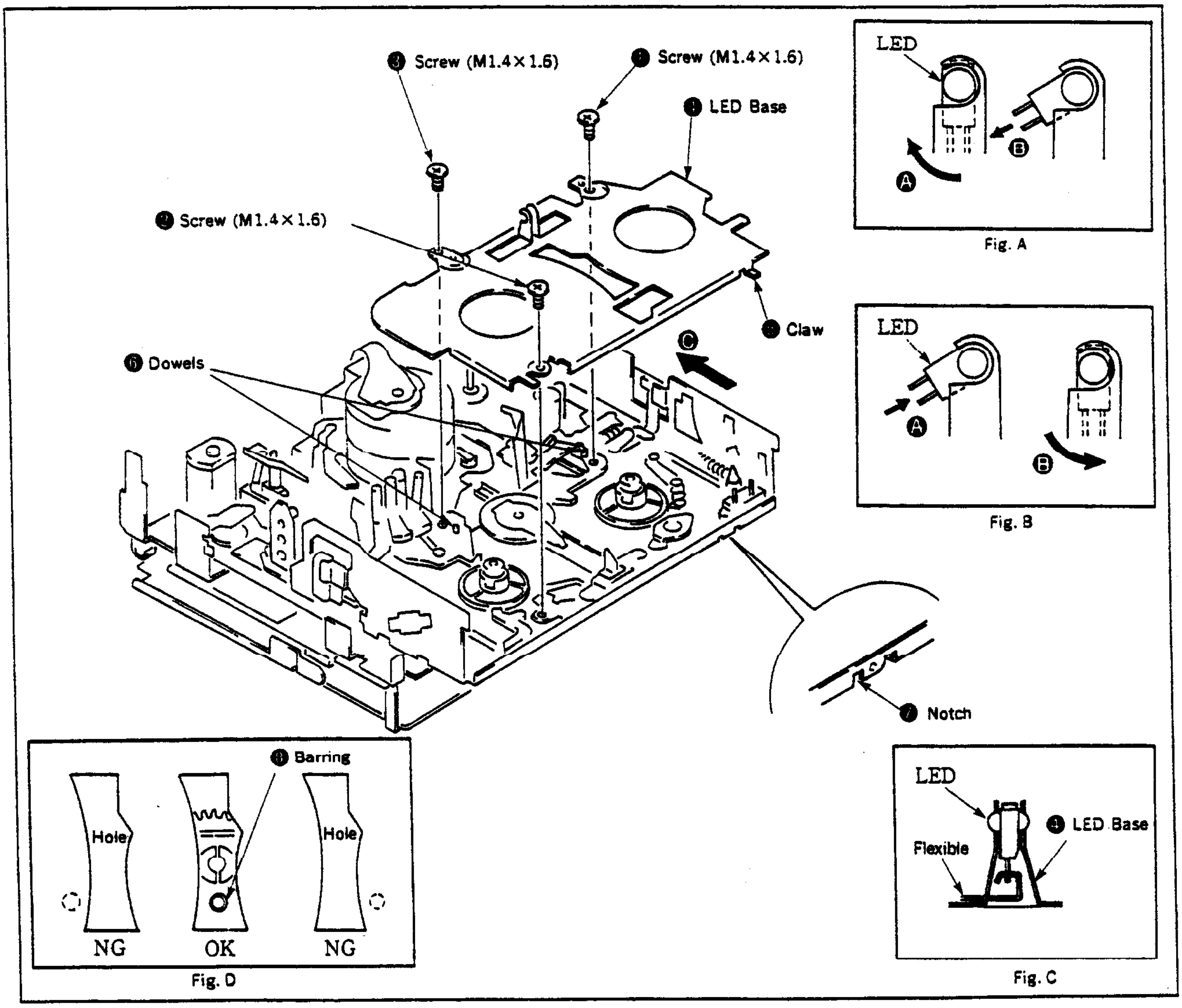

❸ Screw (M1.4×1.6)
❶ Screw (M1.4×1.6)
❹ LED Base
❷ Screw (M1.4×1.6)
❺ Claw
❻ Dowels
Ⓒ
❼ Notch
LED
Ⓐ
Ⓑ
LED
Ⓐ
Ⓑ
❽ Barring
Hole
Hole
NG
OK
NG
LED
❹ LED Base
Flexible

Fig. A

Fig. B

Fig. D

Fig. C

Fig. 8

3-2 RL BASE ASSEMBLY, RETAINER (Fig. 9)

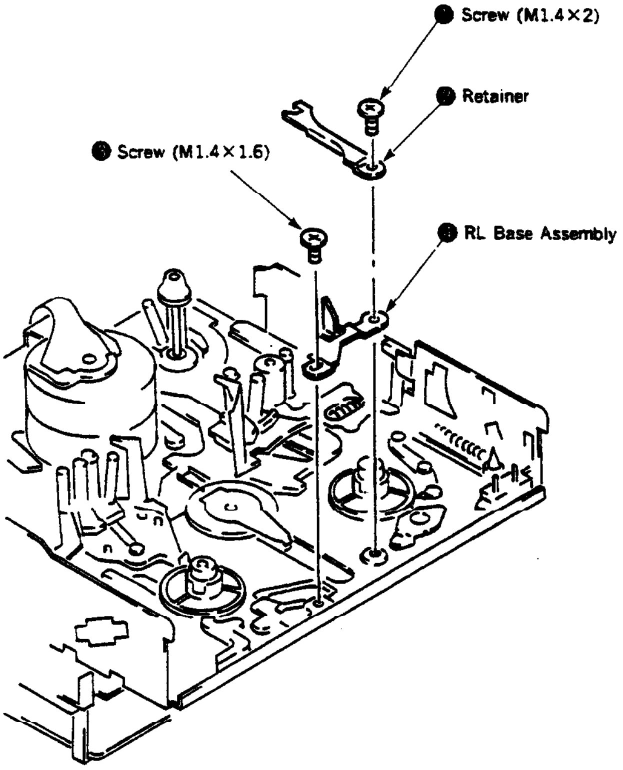
1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder assemlby.
3) Referring to 3-1, remove the LED base.
4) Remove the screw ●, and then, retainer ●.
5) Remove the screw ●, and then, RL base assembly ●.

2. Mounting

1) Select the USE mode.
2) With the screw ●, mount the RL base assembly ● to the LS chassis.
3) With the screw ● fix the retainer ● to the RL base assembly ●.

   When this is done, align the bump part ⁕ of the retainer ● with the bump part ⁕ of the guide rail T. (Fig. A)
4) Referring to 3-1, mount the LED base.
5) Referring to 1-1, mount the cassette compartment holder assembly.


● Screw (M1.4×2)
● Retainer
● Screw (M1.4×1.6)
● RL Base Assembly

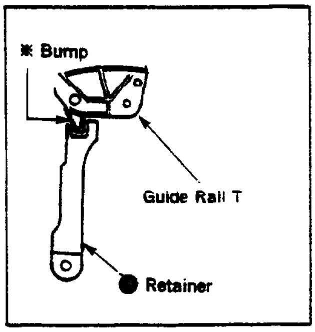

⁕ Bump
Guide Rail T
● Retainer

Fig. A

Fig. 9

3-3 TABLE ASSY, REEL, SUPPLY (Fig. 10)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder assembly.
3) Referring to 3-1, remove the LED base.
4) As shown in Fig. A, making use of slackness of the tension regulator string ● in the USE mode, remove the string out of the groove of the table assy, reel, supply ●. When this is done, be careful not to bend the tension regulator string ● and the S soft arm ● must be moved in a direction of the arrow Ⓑ.
5) Remove the table assy, reel, supply ●.

Note : Dismount and remount the table assy, reel, supply ●, holding the reel claw ※.

2. Mounting

1) Select the USE mode.
2) As shown in Fig. B, move the S soft arm ● in a direction of the arrow Ⓑ.
3) Avoiding the tension regulator string ●, mount the table assy, reel, supply ● to the shaft ●.
4) Put the tension regulator string ● in the groove of the table assy, reel, supply ● and fit it properly by turning the table assy, reel, supply ●.
5) Referring to 3-1, mount the LED base.
6) Referring to 1-1, mount the cassette compartment holder assembly.

Note : Do not touch the tension regulator string ● with naked hand. Also, be careful of adhesion of grease, etc.

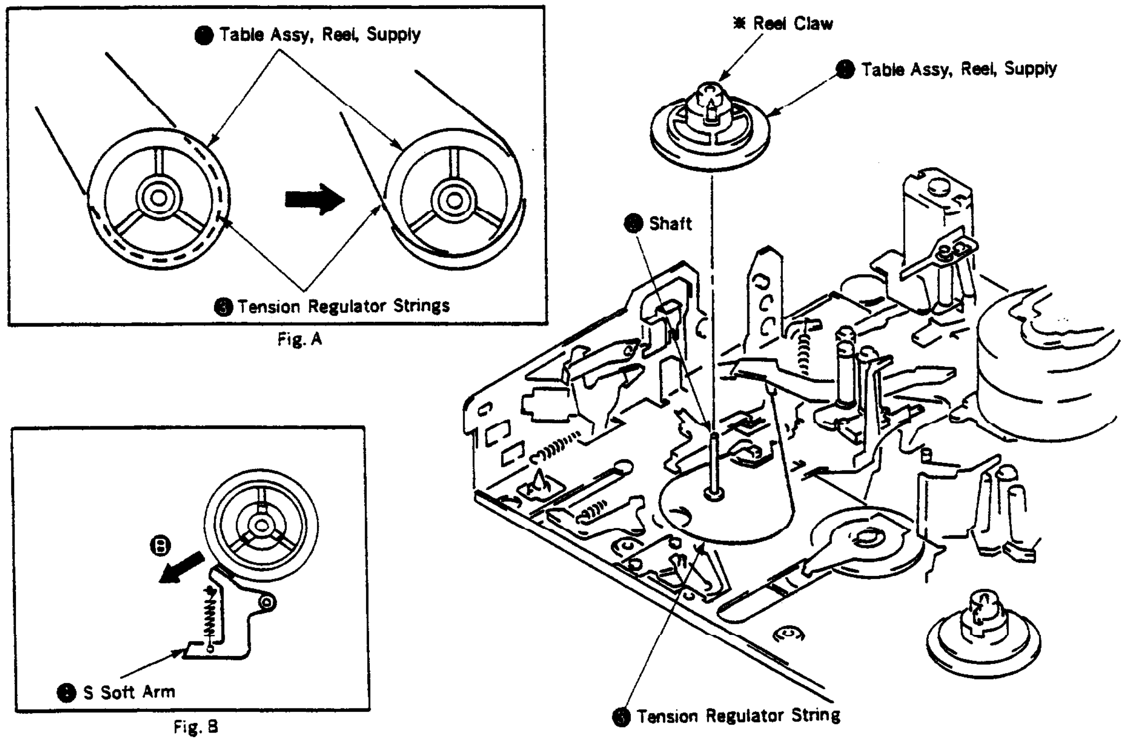

● Table Assy, Reel, Supply
● Tension Regulator Strings
Ⓑ
● S Soft Arm
※ Reel Claw
● Table Assy, Reel, Supply
● Shaft
● Tension Regulator String

Fig. A

Fig. B

Fig. 10

3-4 TABLE ASSY, REEL, TAKE-UP (Fig. 11)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder assembly.
3) Referring to 3-1, remove the LED base.
4) Referring to 3-2, remove the retainer.
5) Dispace the T ratchet ❶ in a direction of the arrowⒶ.
6) With the claw (T ratchet head) of the T ratchet ❶ moved in a direction of the arrowⒷ, remove the Table assy, reel, take-up ❷.

Note : Dismount and remount the Table assy, reel, take-up ❷, holding the reel claw ※.

2. Mounting

1) Select the USE mode.
2) With the claw (T ratchet head) of the T ratchet ❶ moved in an arrow direction, mount the Table assy, reel, take-up ❷ to the shaft ❸.
3) Referring to 3-2, mount the retainer.
4) Referring to 3-1, mount the LED base.
5) Referring to 1-1, mount the cassette compartment holder assembly.

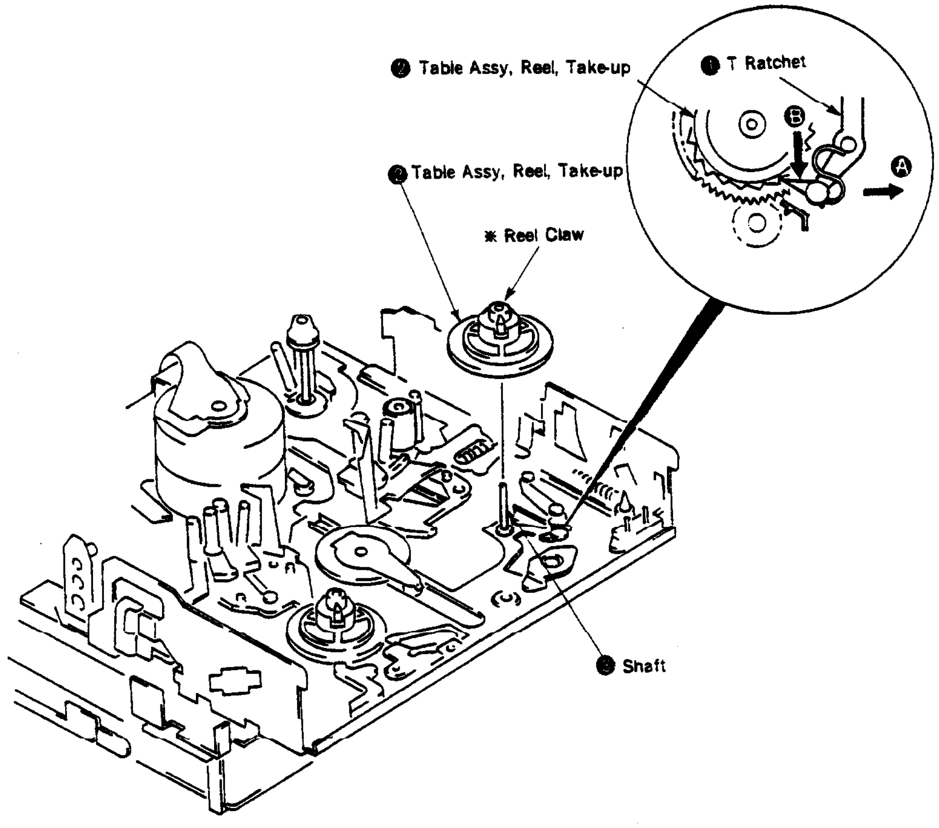


Fig. 11

3-5 ONEWAY CLUTCH ASSEMBLY (Fig. 12)

1. Removal

1) Select the USE mode.
2) Referring to the cassette compartment holder assembly.
3) Referring to 3-1, remove the LED base.
4) Remove the screw ●, and then, oneway clutch assembly ●.

2. Mounting

1) Select the USE mode.
2) Mount the oneway clutch assembly ● to the LS chassis and fix with the screw ●.
3) Referring 3-1, mount the LED base.
4) Referring to 1-1, mount the cassette compartment holder assembly.

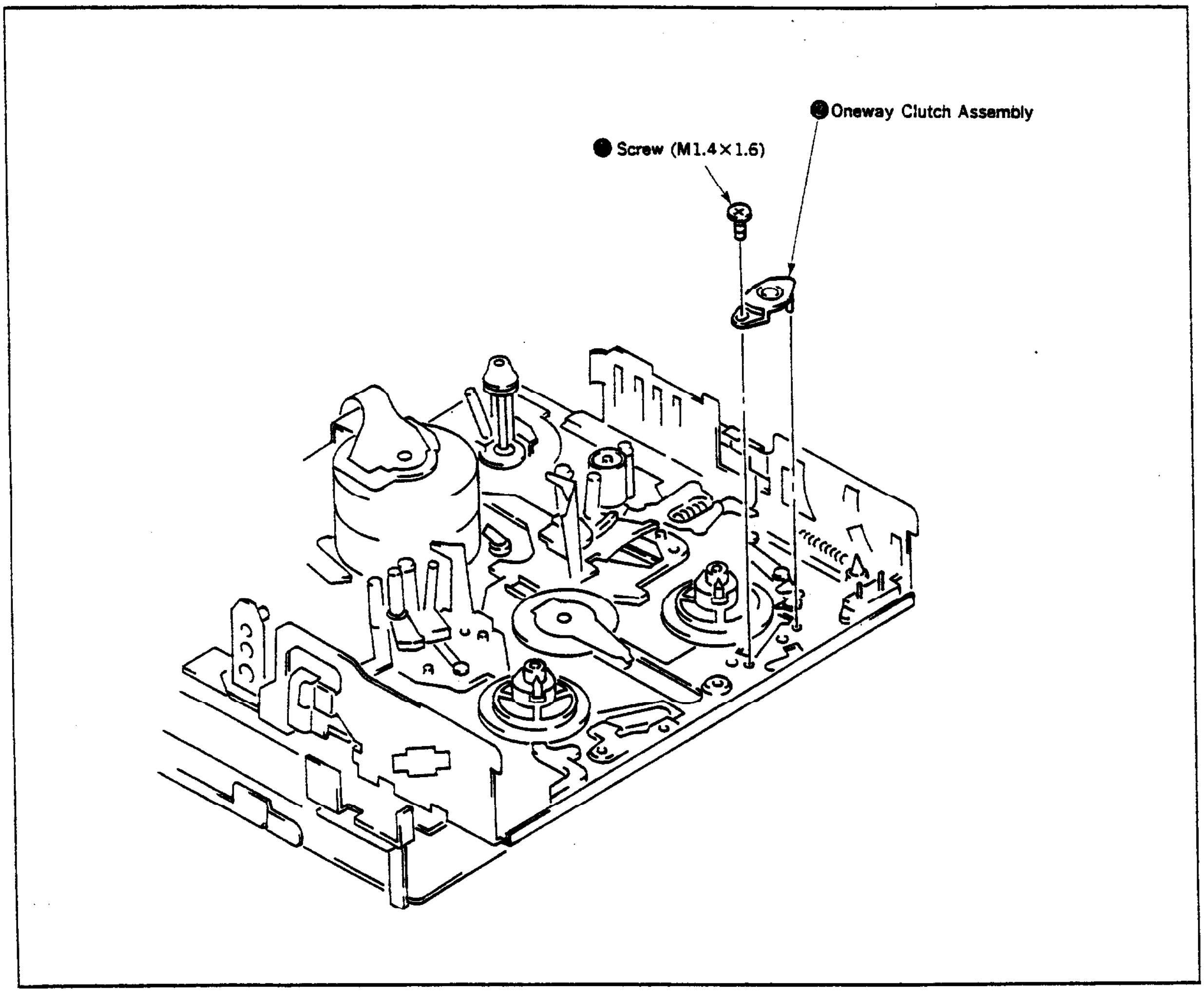


Fig. 12

3-6 S SOFT ARM ASSEMBLY (Fig. 13)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder assembly.
3) Referring to 3-1, remove the LED base.
4) Rerove the lock washer ●, and then, the spring, tension ●.
5) Remove the S soft arm assembly ● by rotating it in an arrow direction (until the hook ● comes off the LS chassis).

2. Removal

1) Select the USE mode.
2 As shoms in Fig. A, apply a quarter drip of oil to the arrowindicated part of the shaft ●.
3) Mount the S soft arm assembly ● to the shaft ●, rotating it in as arrow direction. (Be careful not to bend the hook ●.)
4) Hook the spring, tension 2 onto the claw and fix it with lock washer 1.
5) Referring to 3-1, mount the LED base.
6) Referring to 1-1, mount the cassette compartment holder assembly.

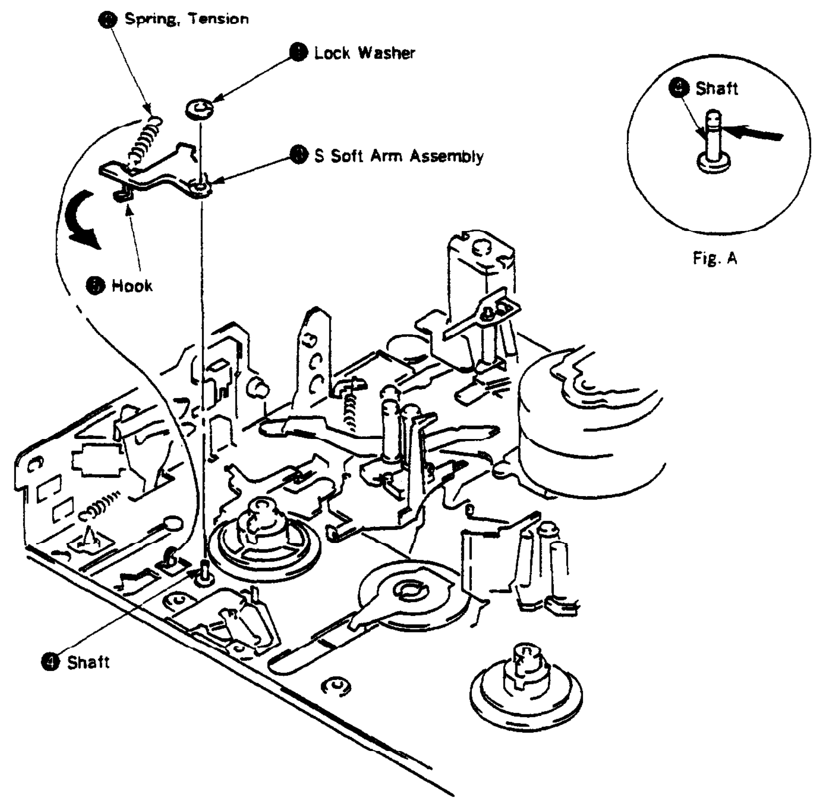


Fig. 13

3-7 LS CHASSIS ASSEMBLY (Fig. 14)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder.
3) Referring to 3-1, remove the LED base.
4) Referring to 3-2, remove the RL base assembly and retainer.
5) Remove the lock washer ①, and then, arm assy gear ②.
6) Select the Q, REW mode.
7) Remove the flexible rotary shaft ③, and then, the flexible connector ④.
8) Remove the E retaining ring ⑤ and three screws ⑥.
9) Remove the LS chassis assembly ⑦ in a direction of the arrow Ⓓ.

2. Mounting

1) As shown in Fig. A, apply Molyton grease to the arrow-indicated part of the LS chassis assembly ⑦.
2) Unload in the RDY mode. Start docking in the Q, REW mode after first GL. When docking the mechanical chassis and LS chassis assembly ⑦, it is necessary to place the following parts at specified positions.
3) Put the pin ●of the pinch arm assembly ●into the left side of the pinch press arm assembly●. (Fig.19)
4) Move the TG-1 arm assembly●in a direction of the arrow Ⓐ to put the pin ●into the concave of the arm assembly ●. (Fig. 17)
5) put the pin●of the S ratchet●into the right side the of the arm assembly●. (Fig. 17)

Simultaneously performing the operations above, push the roller of the guide lock arm ● With the arm arc portion of the guide arm T assembly● (Fig. 15) to push the LS chassis assembly ⑦ in a direction of the arrow Ⓔ, and at the same time, engage the claws of the guide rail base 1●, guide rail base 2●and guide rail base3●with those of the guide rail S● and guide rail T●. (Fig. 16)

Then, align the shafts ⑨ of the mechanical chassis With the four long joints of the LS chassis assembly ⑦, and put the LS pin●of the LS arm assembly●in the groove of the LS cam plate●. (Fig.18)

Note : Before docking, confirm that both EJ arm and LS arm are deeply inserted into the shafts. (If not properly fit, the set does not function even if the LS chassis is docked.

6) Mount the E retaining ring ⑤ and three screws ⑥.
7) Mount the flexible rotary shaft ③ and flexible connector ④.
8) Select the USE mode.
9) Mount the arm assy gear ② and fix with the lock washer ①.
10) Referring to 3-2, mount the RL base assembly and retainer.
11) Referring to 3-1, mount the LED base.
12) Referring to 1-1, mount the cassette compartment holder assembly.

Note : Using the mode selector, confirm that loading and unloading are performed smoothly.

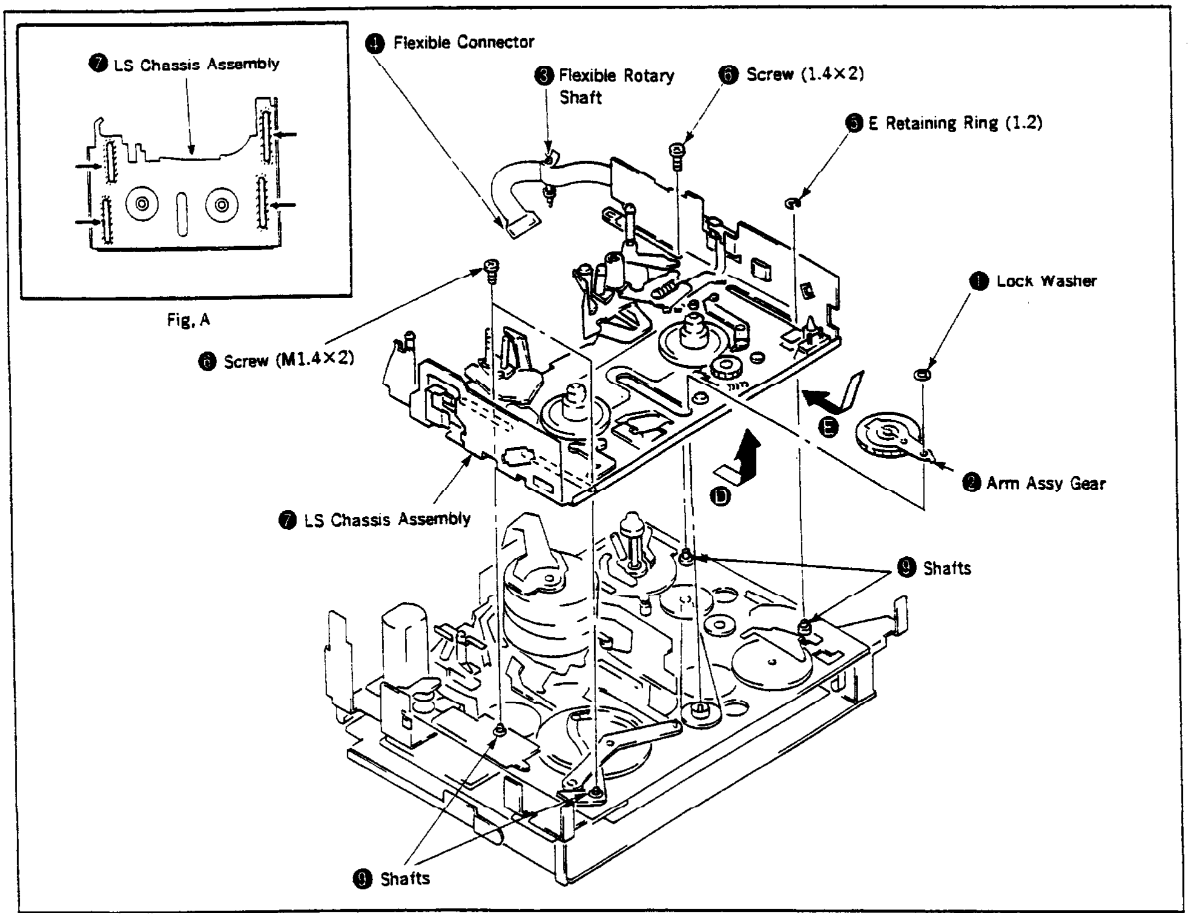


Fig. 14

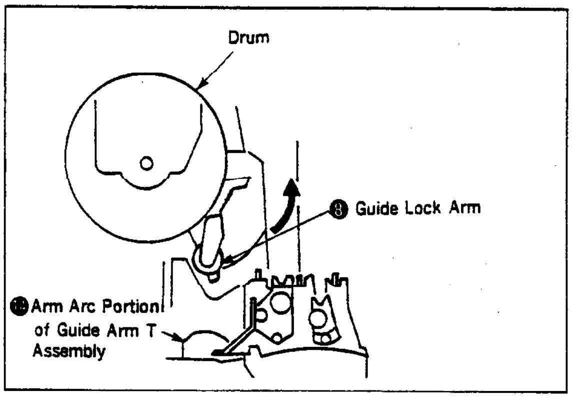

Drum
⑧ Guide Lock Arm
Arm Arc Portion of Guide Arm T Assembly

Fig. 15

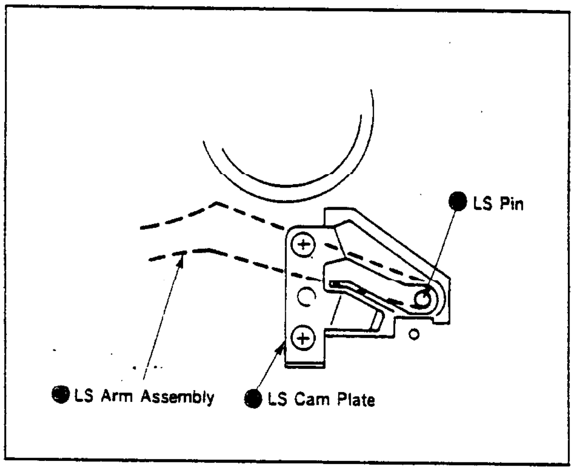

LS Pin
LS Arm Assembly
LS Cam Plate

Fig. 18

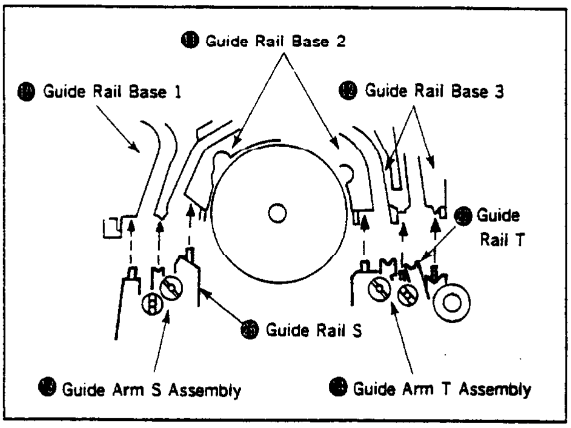

⑪ Guide Rail Base 2
⑩ Guide Rail Base 1
⑫ Guide Rail Base 3
Guide Rail T
Guide Rail S
Guide Arm S Assembly
Guide Arm T Assembly

Fig. 16

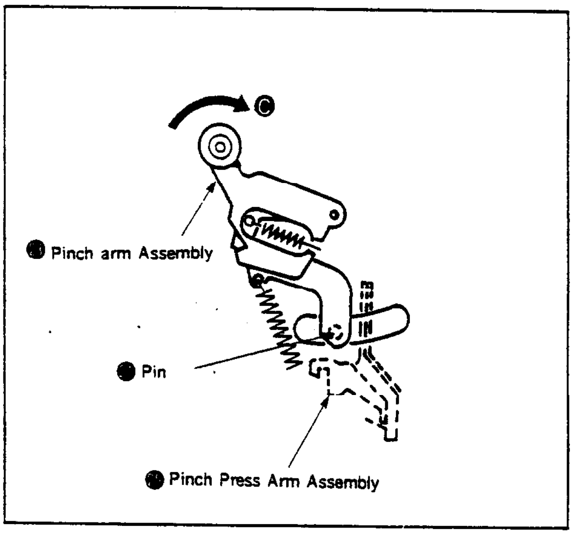

Ⓒ
Pinch arm Assembly
Pin
Pinch Press Arm Assembly

Fig. 19

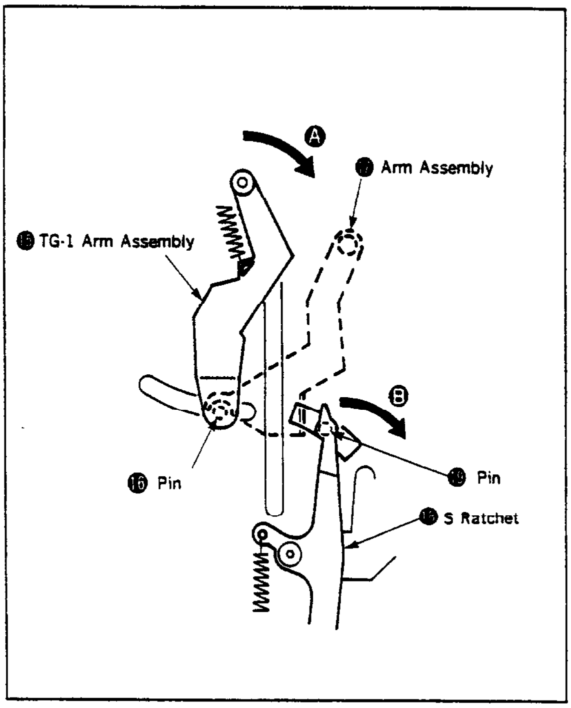

Ⓐ
Arm Assembly
TG-1 Arm Assembly
Ⓑ
Pin
Pin
S Ratchet

Fig. 17

-8 PINCH ARM ASSEMBLY (Fig. 20)

. Removal

) Referring to 1-1, remove the cassette compartment holder assembly.

) Referring to 3-7, remove the LS chassis assembly.

) Remove the lock washer ❷ from the back of the LS chassis assembly ❶.

) Remove the spring, tension ❸, and then, pinch arm assembly ❹.

2. Mounting

1) As shown in Fig. A, apply oil to the hole of the boss ❺ over one third of a drip up to half a drip.
2) put the rotation center of the pinch arm assembly in the boss ❺ hole, and the pin ❻ in the long hole.
3) Hook the spring, tension ❸ onto the upper groove of the pinch return spring shaft ❼.
4) Mount the lock washer ❷ from the back of the LS chassis assembly ❶.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 1-1, mount the cassette compartment holder assembly.

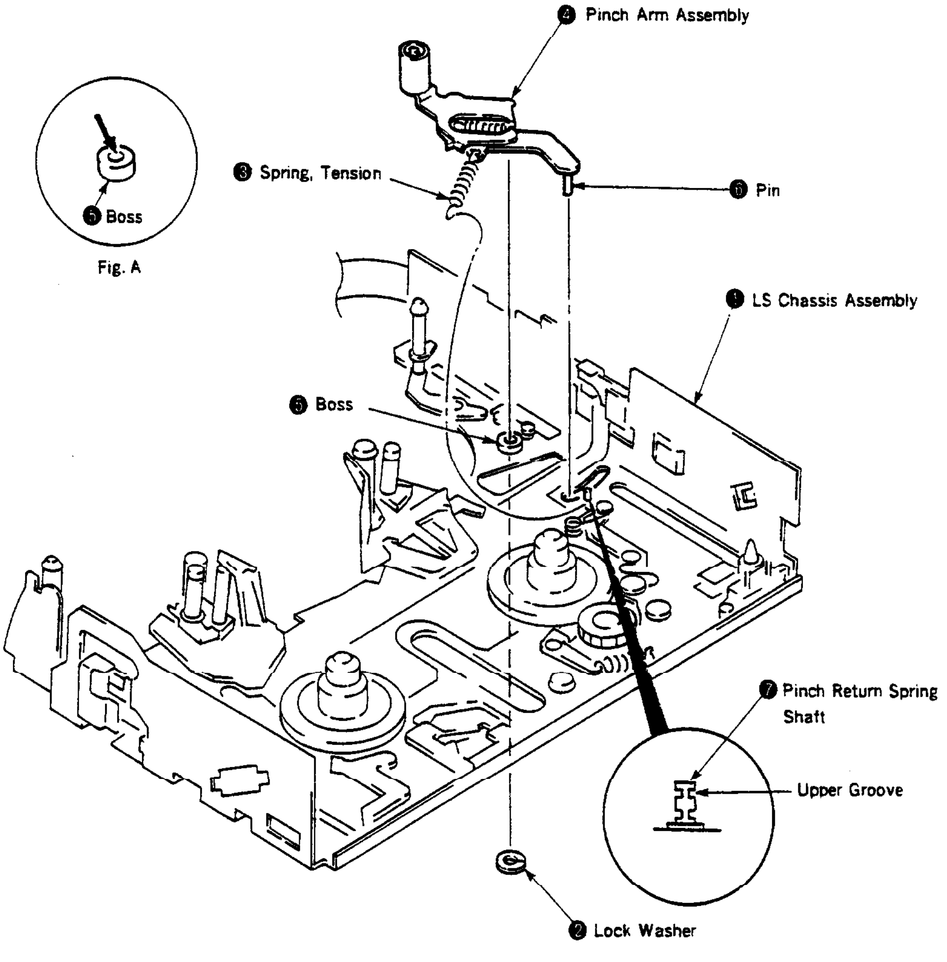

❹ Pinch Arm Assembly
❸ Spring, Tension
❻ Pin
❺ Boss
Fig. A
❶ LS Chassis Assembly
❺ Boss
❼ Pinch Return Spring Shaft
Upper Groove
❷ Lock Washer

Fig. 20

3-9 TG-11 ARM ASSEMBLY (Fig. 21)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis assembly.
3) Remove the lock washer ❷ from the back of the LS chassis assembly ❶.
4) Remove the TG-11 arm assembly ❸ and spring, torsion ❹.

Note : Be careful not to deform the TG-11 arm.

2. Mounting

1) As shown in Fig. A, apply oil to a boss hole over one third of a drip up a half a drip.
2) As shown in Fig. B, put the longer arm of the spring, torsion ❹ between the pinch arm boss ❺ and cam slider shaft ❽ of the LS chassis. Next, Hook the shorter arm of the spring, torsion ❹ around the pin ❻ of the TG-11 arm assembly ❸, rotate the TG-11 arm assembly and fix with the lock washer ❷. When this is done, see to it that the pin ❻ of the TG-11 arm assembly ❸ is located to the left side of the cam slider ❾ as shown in Fig. C.
3) Referring to 3-7, mount the LS chassis.
4) Referring to 1-1, mount the cassette compartment holder.

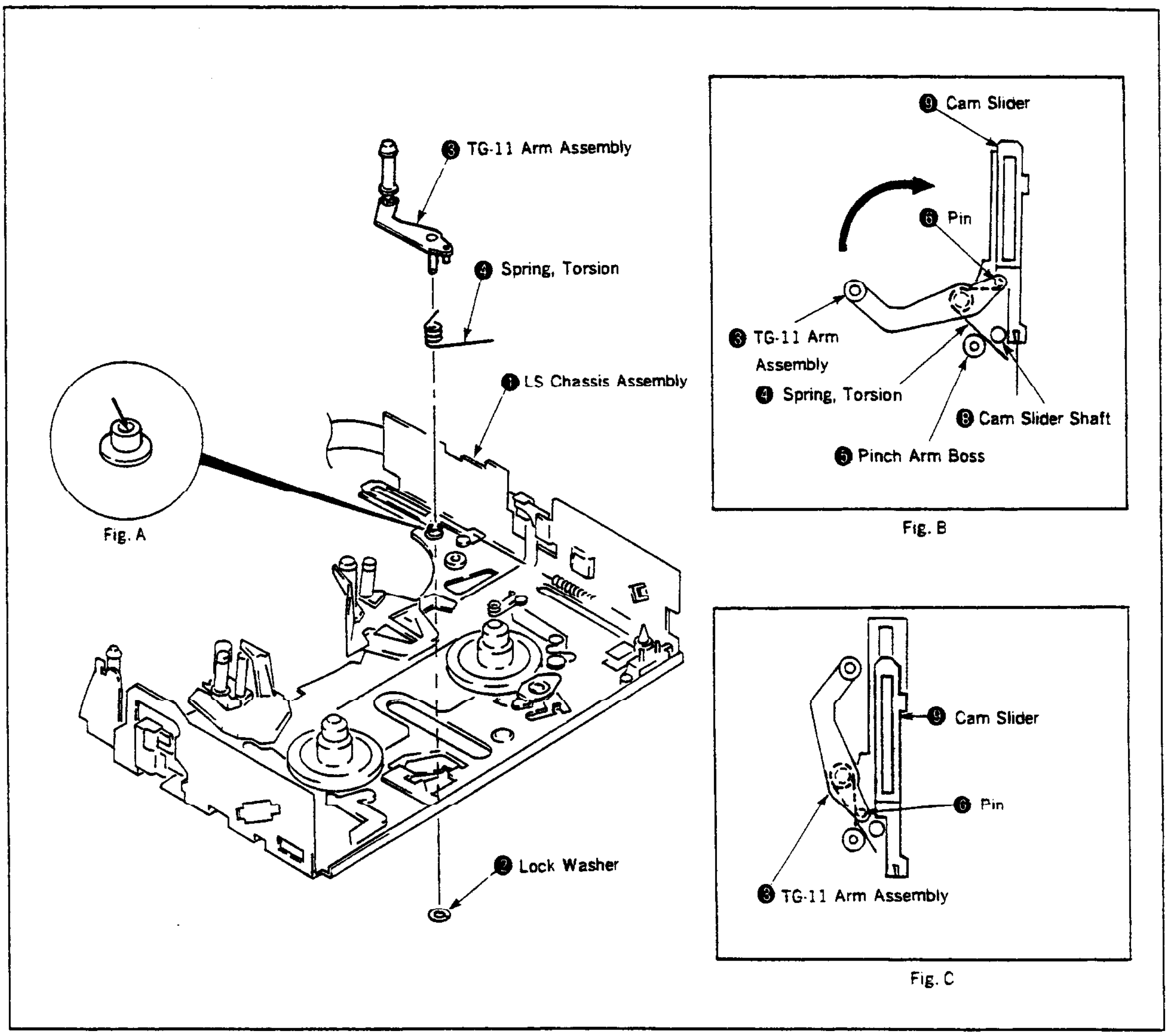

❸ TG-11 Arm Assembly
❹ Spring, Torsion
❶ LS Chassis Assembly
❷ Lock Washer
Fig. A
❾ Cam Slider
❻ Pin
❸ TG-11 Arm Assembly
❹ Spring, Torsion
❽ Cam Slider Shaft
❺ Pinch Arm Boss
Fig. B
❾ Cam Slider
❻ Pin
❸ TG-11 Arm Assembly
Fig. C

Fig. 21

3-10 TG-1 ARM ASSEMBLY (Fig. 22)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis.
3) Referring to 3-3, remove the table assy, reel, supply.
4) Remove the lock washer ❷ from the back of the LS chassis assembly ❶.
5) Remove the spring, tension ❸. Remove the string joint ❹ from the dowel ❺ of the TG-1 adjustment block ❾ by rotating it in a direction of the arrow Ⓐ as shown in Fig. C.
6) Remove the TG-1 arm assembly ❻.

Note : Dismount and remount the string joint ❹ carefully not to deform it.

2. Mounting

1) As shown in Fig. A, apply oil to the hole of the boss ❼ over one third of a drip up to half a drip.
2) As shown in Fig. C, mount the string joint ❹ to the TG-1 adjustment block ❾ in the opposite direction of the arrow Ⓐ.
3) Mount the TG-1 arm assembly ❻ to the boss ❼ in such a manner not to touch the guide and insert the pin ❽ into the long hole.
4) Hook the spring, tension ❸ onto the position shown in Fig. B.
5) Mount the lock washer ❷ from the back of the LS chassis assembly ❶.
6) Referring to 3-3, mount the table assy, reel, supply.
7) Referring to 3-7, mount the LS chassis assembly.
8) Referring to 1-1, mount the cassette compartment holder assembly.

Note : Referring to 3-27, adjust a tension regulator position.

Note : Referring to 3-28, adjust a FWD back tension.

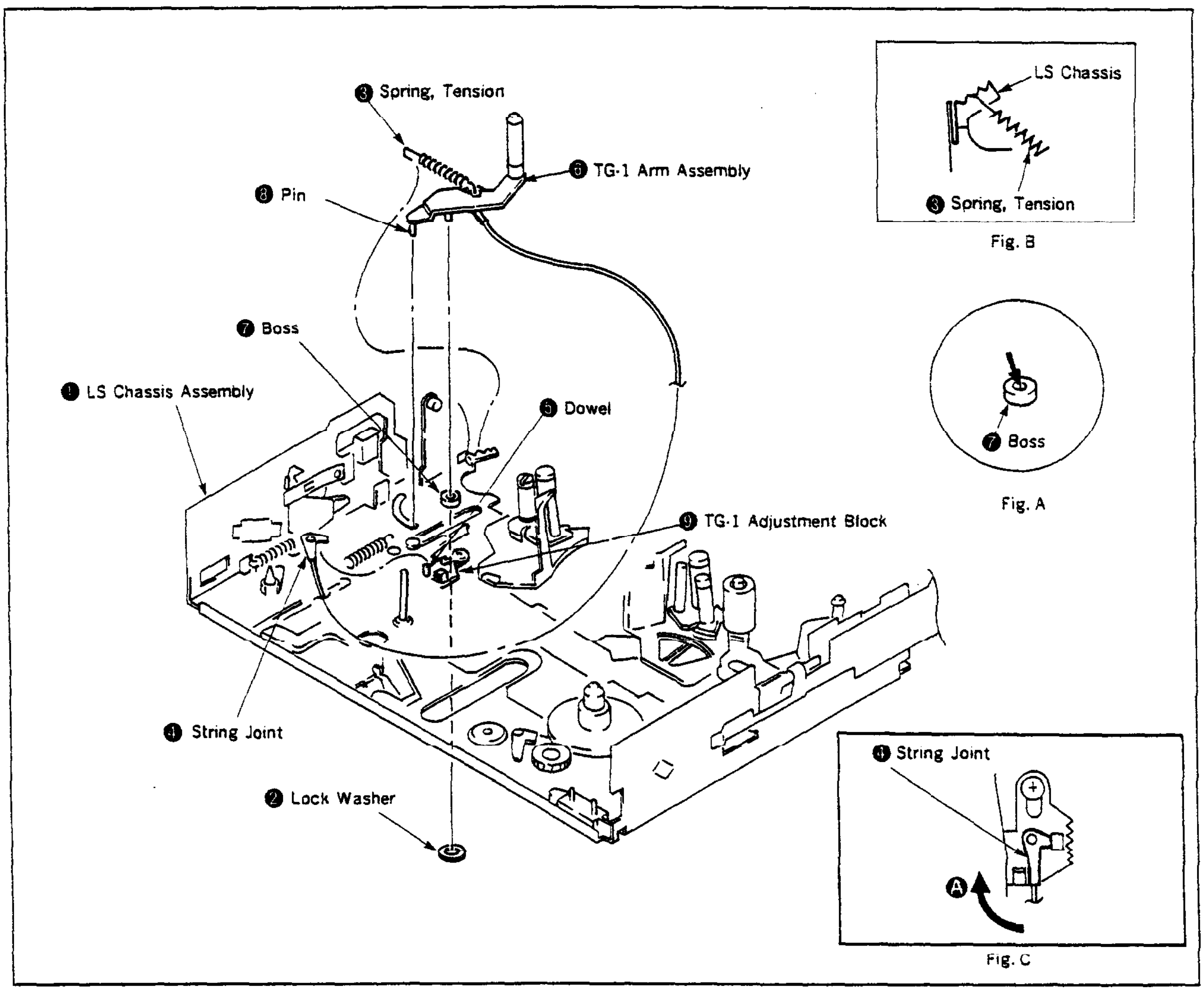

❸ Spring, Tension
❻ TG-1 Arm Assembly
❽ Pin
❼ Boss
❶ LS Chassis Assembly
❺ Dowel
❾ TG-1 Adjustment Block
❹ String Joint
❷ Lock Washer
LS Chassis
❸ Spring, Tension
❼ Boss
❹ String Joint
Ⓐ

Fig. B

Fig. A

Fig. C

Fig. 22

3-11 STRING JOINT (Fig. 23)

1. Removal

1) Referring to 3-10, remove the TG-1 arm assembly ❶.
2) Remove the joint holder ❷, and then, string assembly ❸.

2. Mounting

1) Put the dowel ❹ of the TG-1 arm assembly ❶ into the hole of the string assembly ❸ and mount the joint holder ❷. (Apply screw lock between the joint holder and TG-1 arm assembly.)
2) Referring to 3-10, mount the TG-1 arm assembly ❶.

Note : Be careful not to bend the string assembly ❸.

Note : Do not touch the guide ✱.

Note : The joint holder ❷, which was removed once, must not be used again.

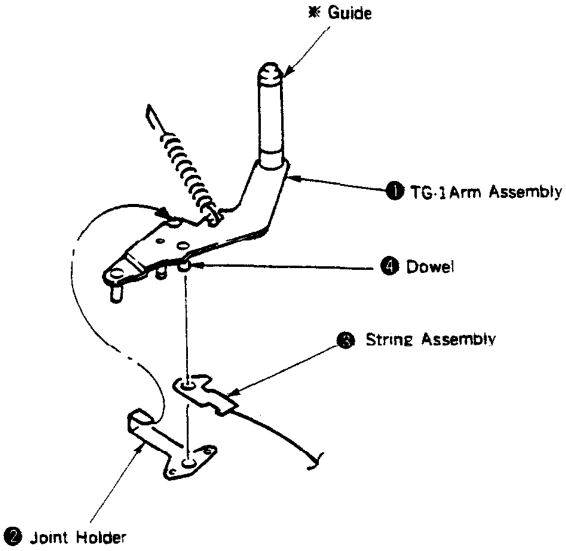

✱ Guide
❶ TG-1 Arm Assembly
❹ Dowel
❸ String Assembly
❷ Joint Holder

Fig. 23

3-12 GUIDE ARM T ASSEMBLY, GUIDE ARM S ASSEMBLY

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove *the LS chassis assembly.*
3) Rotate the guide arm T assembly ❶ and guide arm S assembly in arrow directions respectively, align their shafts ❸ with the holes as shown in Fig. A, and remove them. (Fig. 24)

Note : Do not touch the guide ✱. (Fig. 25 and Fig. 26)

2. Mounting

1) After inserting the guide arn T and S assemblies in the reverse order of removal, rotate them in the opposite directions of the *arrows respectively.*
2) Fit the TG-7 base assembly ❺ and TG-9 base assembly ❻ in the grooves of the guide rail T ❹. (Fig. 25)
3) Put the shaft ❸ flange in the long groove of the guide rail S ❽, and fit the TG-4 base assembly ❾ and TG-6 base assembly ❿ into the right and left grooves of the guide rail S ❽ respectively.
   When this is done, see to it that the flat spring of the TG-6 base assembly❿ is located below the guide rail S ❽ as shown in Fig. B. (Fig.26)
4) Referring to 3-7, mount the LS chassis assembly.
5) Referring to 1-1, mount the cassette compartment holder assembly.

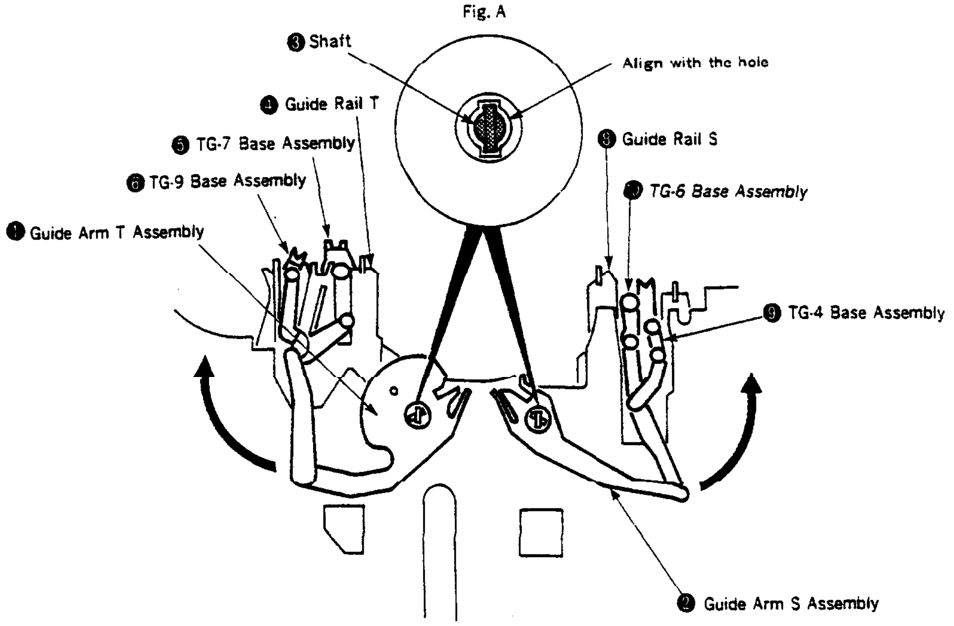


Fig. A
❸ Shaft
Align with the hole
❹ Guide Rail T
❺ TG-7 Base Assembly
❻ TG-9 Base Assembly
❶ Guide Arm T Assembly
❽ Guide Rail S
❿ TG-6 Base Assembly
❾ TG-4 Base Assembly
❷ Guide Arm S Assembly

LS Chassis Assembly Viewed from Back

Fig. 24

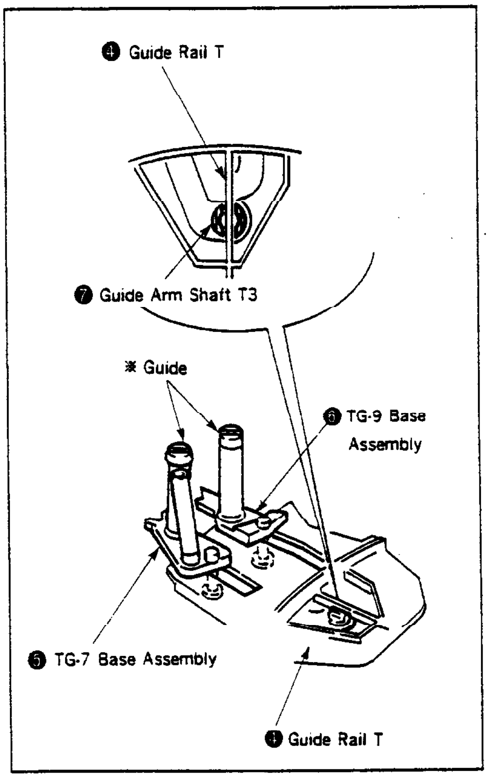

❹ Guide Rail T
❼ Guide Arm Shaft T3
※ Guide
❻ TG-9 Base Assembly
❺ TG-7 Base Assembly
❹ Guide Rail T

Fig. 25

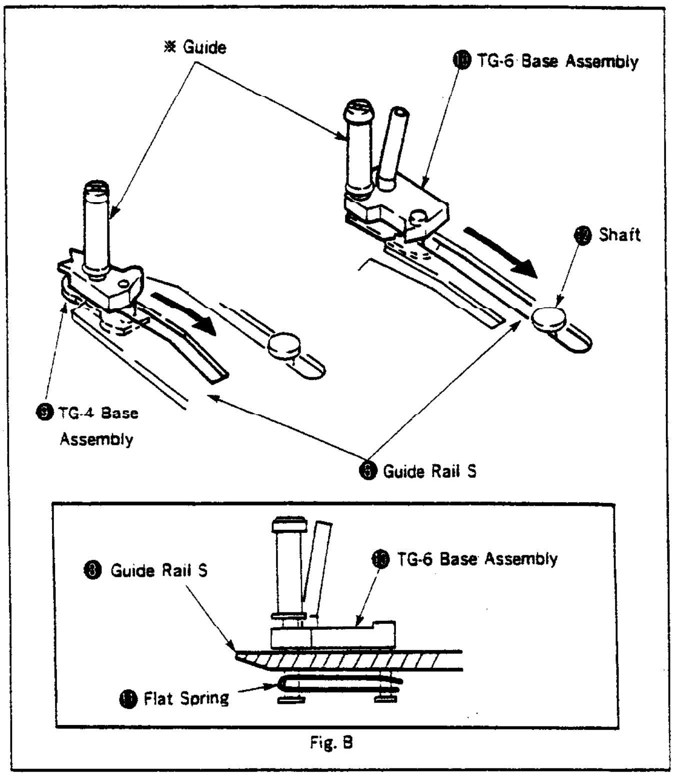

※ Guide
❿ TG-6 Base Assembly
⓬ Shaft
❾ TG-4 Base Assembly
❽ Guide Rail S
❽ Guide Rail S
❿ TG-6 Base Assembly
⓫ Flat Spring

Fig. B

Fig. 26

13 PINCH PRESS ARM ASSEMBLY (Fig. 27)

Removal

Referring to 1-1, remove the cassette compartment holder assembly.

Referring to 3-7, remove the LS chassis.

Remove the screw ❶, and then, pinch press arm assembly ❷.

2. Mounting

1) As shown in A, apply half a drip of molyton grease to an arrowindicated part of a boss hole.
2) As shown in Fig. B, apply half a drip of molyton grease each to the pinch press arm assembly ❷ at 3 places.
3) Put the pin ❹ of the pinch press arm assembly ❷ in the groove of the cam B ❸.
4) Fix. with the screw ❶.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 1-1, mount the cassette compartment holder assembly.

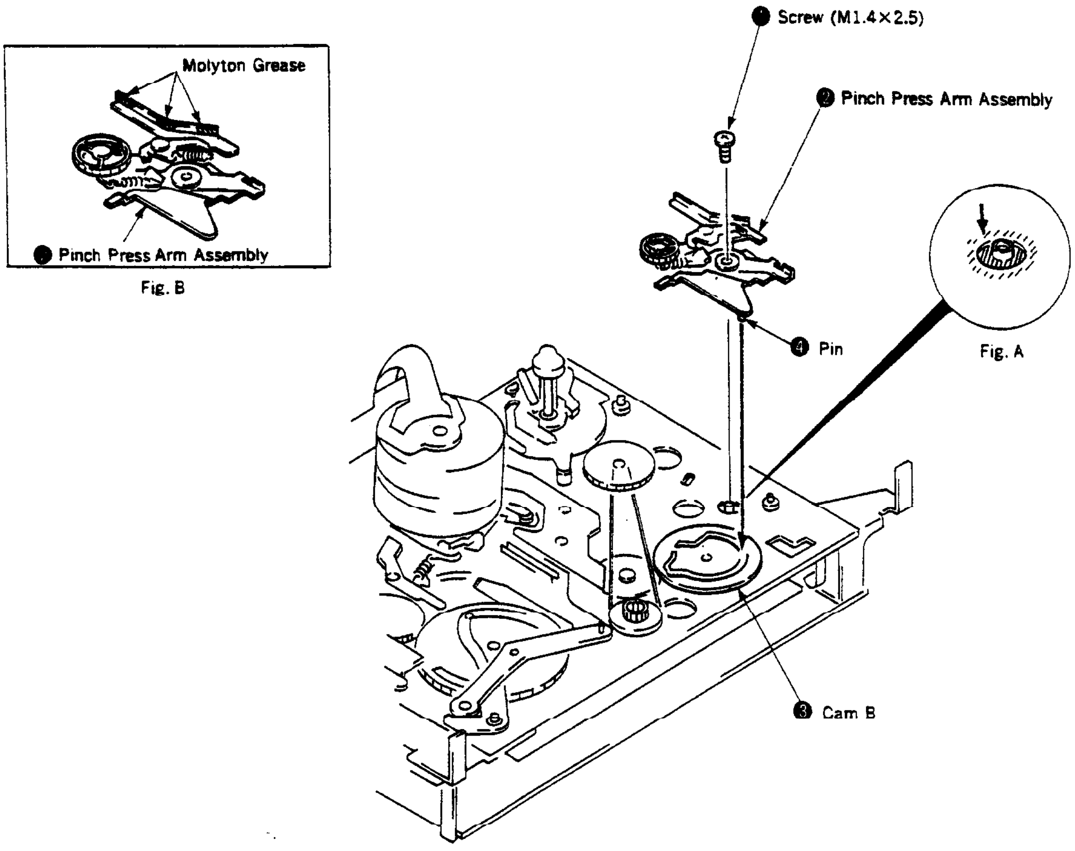

Molyton Grease
❷ Pinch Press Arm Assembly
❶ Screw (M1.4×2.5)
❷ Pinch Press Arm Assembly
❹ Pin
❸ Cam B

Fig. B

Fig. A

Fig. 27

3-14 GL SLIDER ASSEBLY (Fig. 28)

1. Removal

1) Refering to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis assembly.
3) Referring to 3-15, remove the cam A.
4) Shift the GL slider assembly ❹ in a direction of the arrowⒶ.
5) Remove the screw ❶, and then, GL support S ❷.
6) Remove the lock washer ❸, and then, GL slider assembly ❹.

2. Mounting

1) Fit the claw ❺ of the GL slider assembly ❹ in the qroove of the GL support T ❼, and put the roller ❻ in the long hole of the chassis.
2) Stop with the lock washer ❸.
3) Shift the GL slider assembly ❹ in a direction of the arrowⒶ.
4) Fit the claw ❽ of the GL support ❷ in the part of the chassis marked with ⋇ and place the dowel ❾ in the hole of the chassis.
5) Fix with the screw ❶.
6) Referring to 3-7, mount the LS chassis assembly.
7) Referring to 1-1, mount the cassette compartment holder assembly.

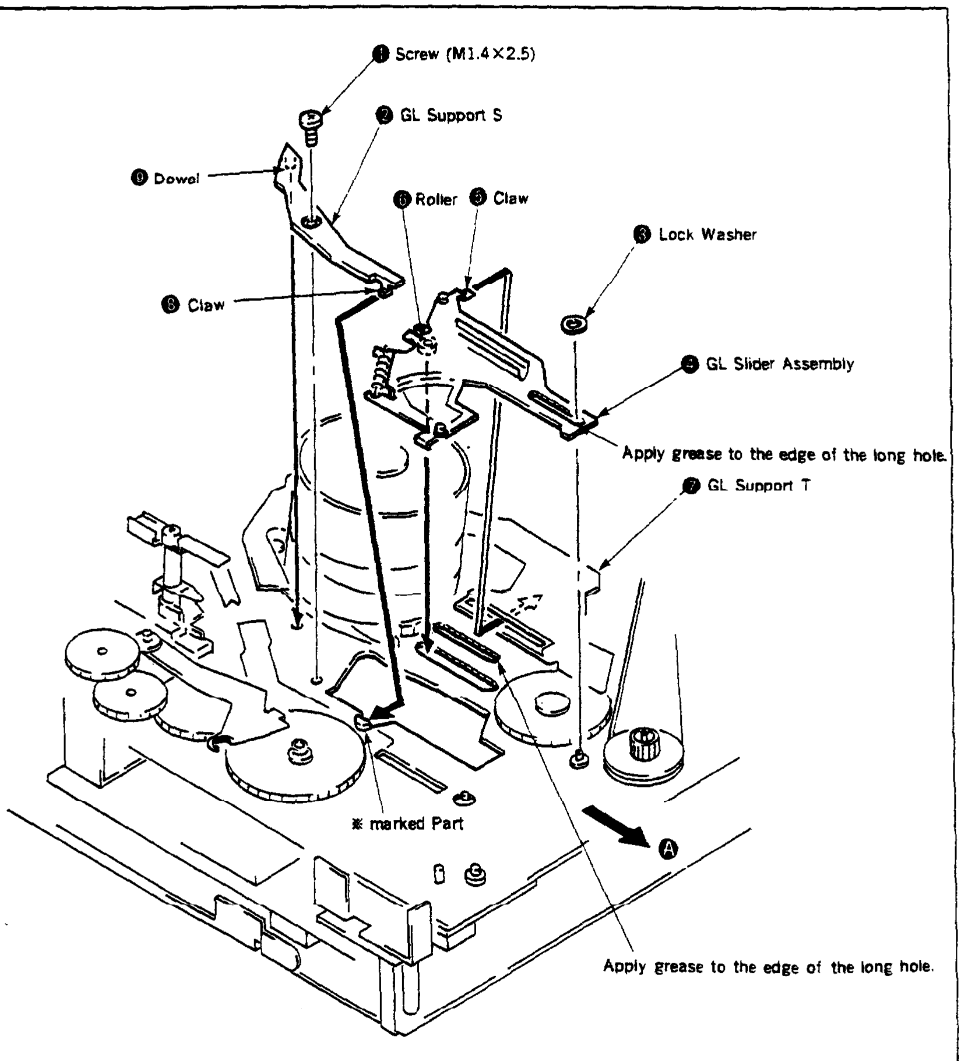

❶ Screw (M1.4×2.5)
❷ GL Support S
❾ Dowel
❻ Roller
❺ Claw
❸ Lock Washer
❽ Claw
❹ GL Slider Assembly
Apply grease to the edge of the long hole.
❼ GL Support T
⋇ marked Part
Ⓐ
Apply grease to the edge of the long hole.

Fig. 28

3-15 PHASE ADJUSTMENT(Fig. 29)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis. (Wen this is done, one of the BLANK, REC and READY modes must be selected.)
3) Remove the two screws ❶, and remove the TG-1 cam base ❷ by moving it in a direction of the arrowⒶ. (Remove the notch ●from the groove of the No. 3 gear shaft.)
4) Remove the screw ❸, and remove the gear retainer ❹ by sliding it in a direction of the arrowⒷ.
5) Remove the arm assembly ❺, No. 0 gear ❻, No. 1 gear assembly ❼, No. 2 gear assembly ❽, No. 3 gear assembly ❾, lock washer●, and then, mode gear assembly●, respectively.
6) Being careful not to lose the LS roller●of the LS arm, remove the LS arm assembly●and EJ arm⓬, respectively.
7) Remove the screw●, and then, cam A●.
8) Referring to 3-13 3), remove the pinch press arm assembly.
9) Remove the screw●, and then, cam B●.

2. Adjustment and Mounting

1) Face the holeⓐ of the mode gear assembly●to a direction of the arrowⒶ, move the GL slider assembly●in a direction of the arrowⒷ, apply molyton grease to the pin of the GL slider assembly●, and mount the LS roller●. (Fig. 30)
2) Set a direction of the cam A●so that the holeⓒ of the cam A ●will be aligned with the hole of the mechanical chassis. (Fig. 31)
3) Move the GL slider●so that the LS roller●will be placed into the grooveⓓ of the cam A●. At the same time, engage the mode gear assembly●with the gear of the relay gear A●, and mount the cam A●. Insert a stick of about ϕ1.5mm in the hole ⓒ of the cam A●. (Fig. 31)
4) Align the holeⓔ of the cam B●with the hole of the mechanical chassis. At the same time, engage the relay gear B● with the gear and mount it. (Fig. 32)
5) Referring to 3-13, mount the pinch press arm assembly.
6) Align the holeⓕ of the No. 3 gear assembly ❾ with the hole of the mechanical chassis, and at the same time, engage the mode gear assembly●with the gear to mount. (Fig. 33)
7) Mount the No. 2 gear assembly ❽, No. 1 gear assembly ❼ and No. 0 gear ❻ in that order. Mount the arm assembly ❺ to the shaft and put the pin●in the groove of the No. 3 gear assembly ❾, (Fig. 34)
8) Put the TG-1 cam base ❷ in place, fit the notch●to the shaft and shift it in an arrow direction, and mount the screws ❶ and ❶'in that order. (Fig. 35)
9) Put the gear retainer ❹ in place, slide it in an arrow direction and fix it with the screw ❸. (Fig. 36)
10) Seeing to it that the EJ arm⓬and the LS roller●of the LS arm assembly●are put in the grooveⓖ of the cam A●, mount them in that order. (Fig. 29 and Fig. 30)
11) Referring to 3-7, mount the LS chassis assembly.
12) Referring to 1-1, mount the cassette compartment holder assembly.

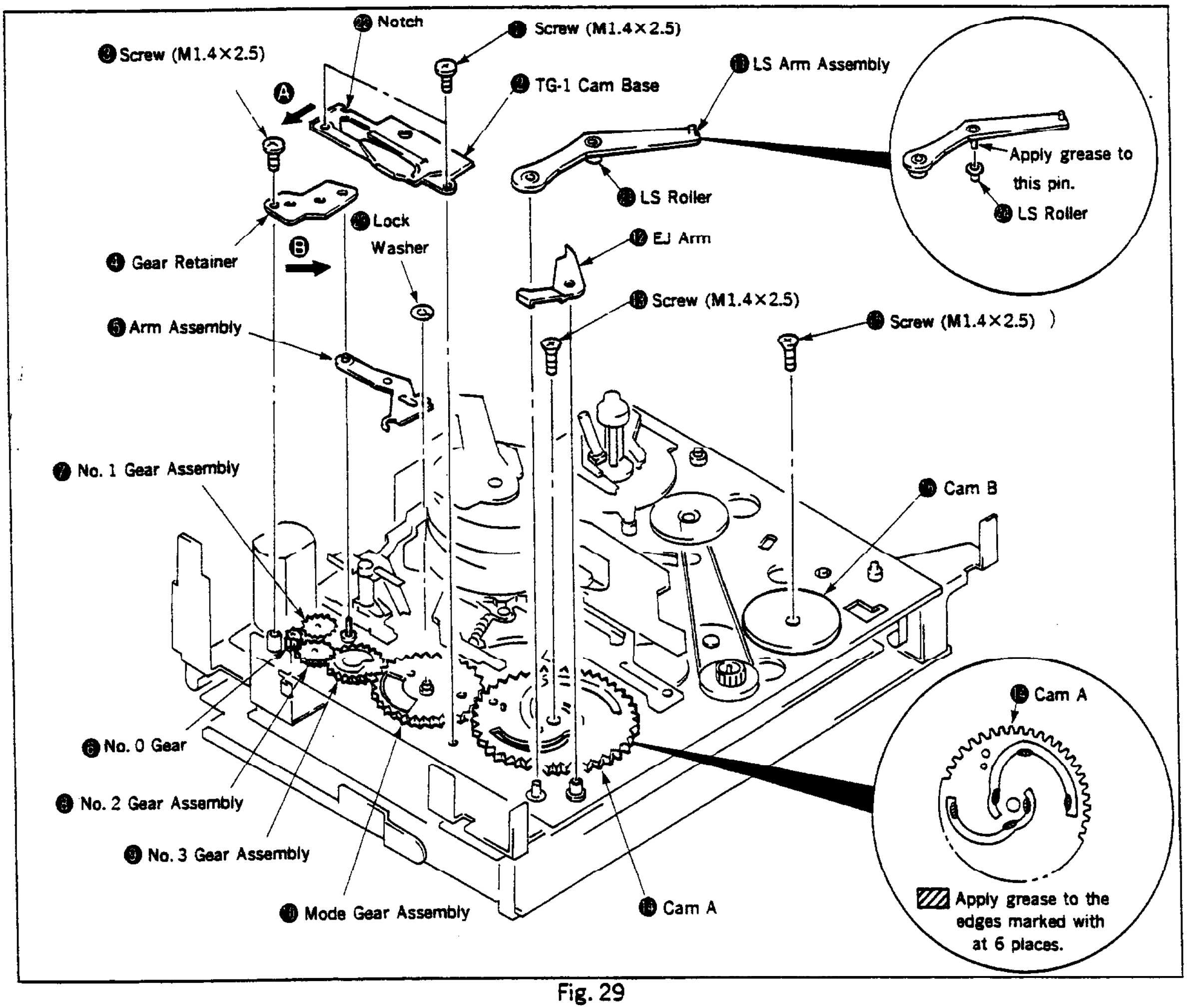

● Notch
❶ Screw (M1.4×2.5)
❸ Screw (M1.4×2.5)
❷ TG-1 Cam Base
● LS Arm Assembly
Ⓐ
Apply grease to this pin.
● LS Roller
● LS Roller
● Lock Washer
⓬ EJ Arm
❹ Gear Retainer
Ⓑ
● Screw (M1.4×2.5)
● Screw (M1.4×2.5)
❺ Arm Assembly
❼ No. 1 Gear Assembly
● Cam B
● Cam A
❻ No. 0 Gear
❽ No. 2 Gear Assembly
❾ No. 3 Gear Assembly
● Mode Gear Assembly
● Cam A
▨ Apply grease to the edges marked with at 6 places.

Fig. 29

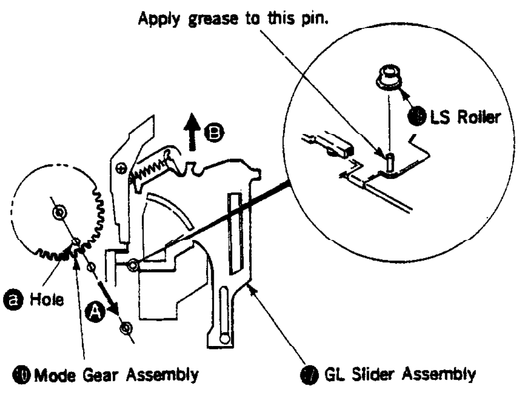

Apply grease to this pin.
LS Roller
Ⓑ
ⓐ Hole
Ⓐ
⑩ Mode Gear Assembly
GL Slider Assembly

Fig. 30

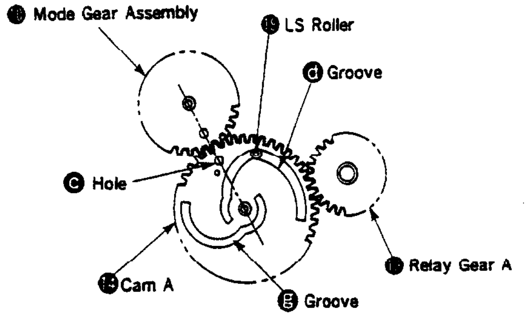

Mode Gear Assembly
LS Roller
ⓓ Groove
ⓒ Hole
Relay Gear A
Cam A
Groove

Fig. 31

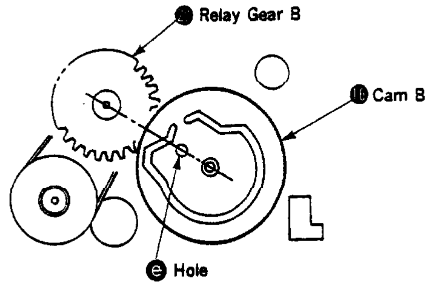

Relay Gear B
Cam B
ⓔ Hole

Fig. 32

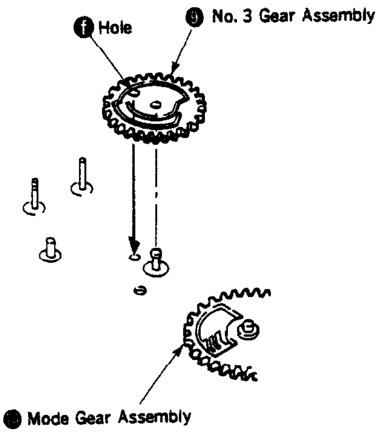

ⓕ Hole
⑨ No. 3 Gear Assembly
Mode Gear Assembly

Fig. 33

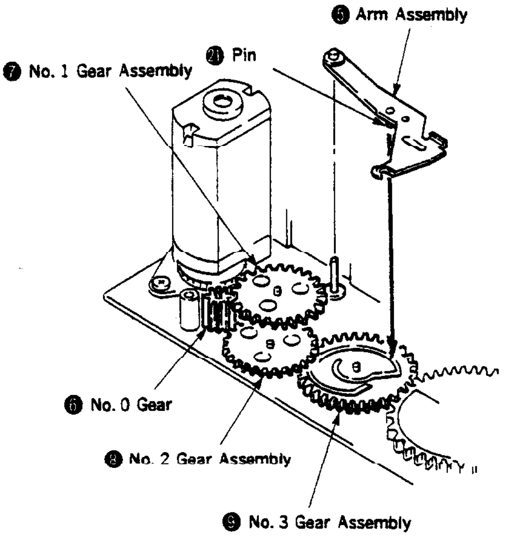

⑤ Arm Assembly
Pin
⑦ No. 1 Gear Assembly
⑥ No. 0 Gear
⑧ No. 2 Gear Assembly
⑨ No. 3 Gear Assembly

Fig. 34

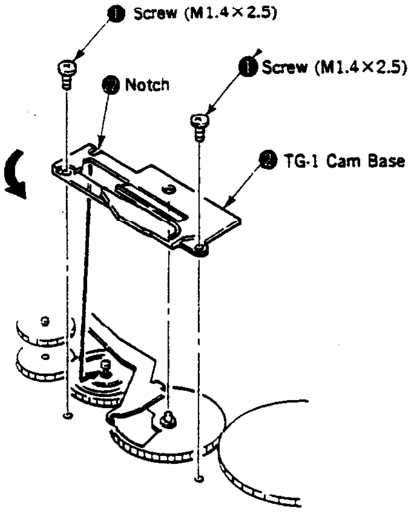

Screw (M1.4×2.5)
Notch
Screw (M1.4×2.5)
TG-1 Cam Base

Fig. 35

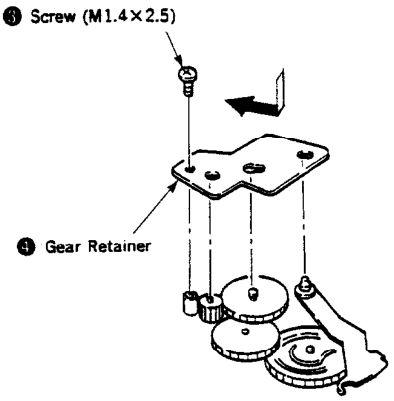

Screw (M1.4×2.5)
Gear Retainer

Fig. 36

.6 GEAR TRAIN OPERATION CHECK (Fig. 37)

Removal

Referring to 1-1, remove the cassette compartment holder assembly.

Referring to 3-7, remove the LS chassis.

Referring to 3-17, remove the loading motor.

Check

Insert the tip of tweezers into the hole a of the cam A ❶.

Rotate the cam A ❶ by about two thirds of a turn in a direction of the arrow Ⓐ, and then, in a direction of the arrow Ⓑ by the same amount. Repeat this 3 times.

When this is done, check that each, gear, the GL slider assembly and LS arm assembly rotate smoothly, and that no load is applied to them.

4) At the same time, check that the LS roller ❷ is located almost at the end point of the groove of the cam A ❶ when the gear train comes into contact with the stoppers at both ends.

Note : When rotating the cam A ❶ with the tip of tweezers, etc., be careful not to scratch the mechanical chassis.

3. Mounting

1) Referring to 3-17, mount the loading motor.
2) Referring to 3-7, mount the LS chassis assembly.
3) Referring to 1-1, mount the cassette compartment holder assembly.

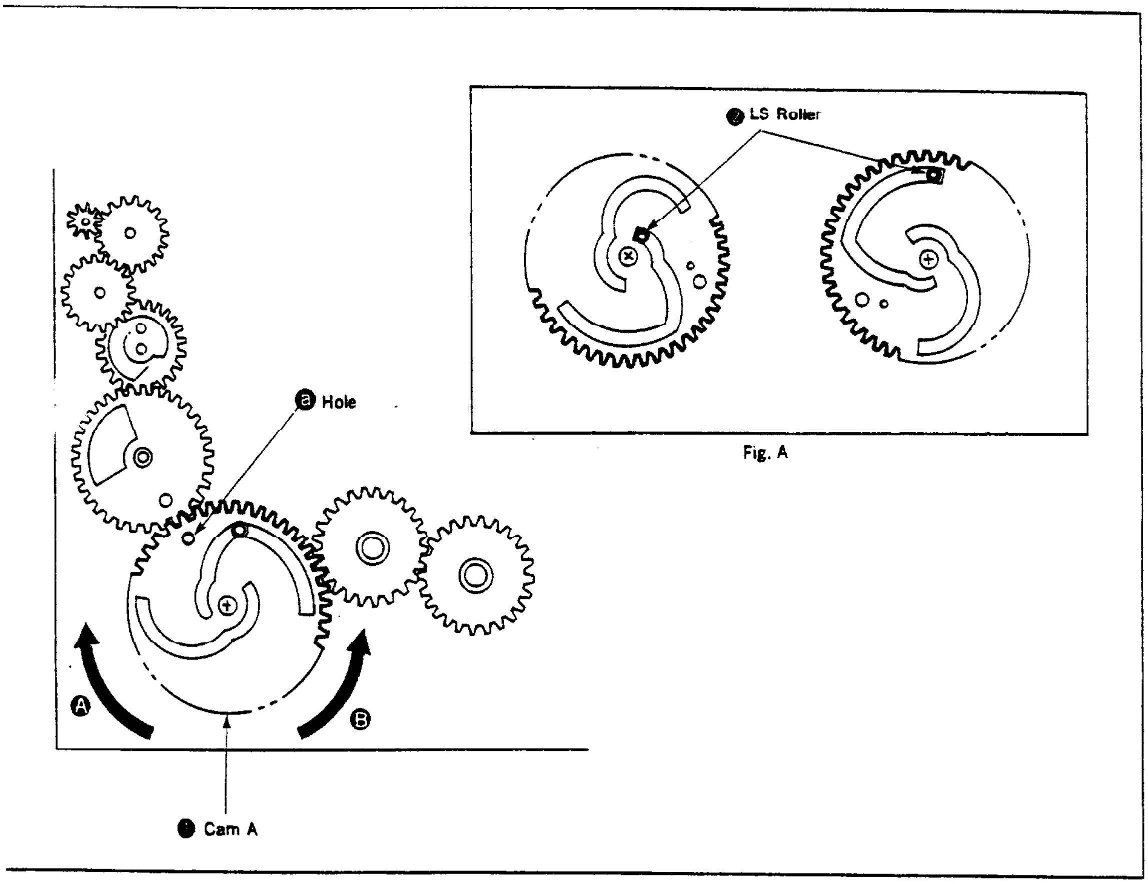


Fig. A

Fig. 37

3-17 LOADING MOTOR ASSEMBLY (Fig. 38)

1. Removal

1) Remove the LB-12 board.
2) Remove the connector ❶.
3) Remove the screws ❷ and ❸, and remove the loading motor assembly ❹ in an arrow direction.

2. Mounting

1) Put the pin ❺ of the loading motor assemmbly ❹ in the hole of the mechanical chassis, and mount it with the screws ❷ and ❸ in that order.
2) Mount the connector ❶.
3) Mount the LB-12 board.

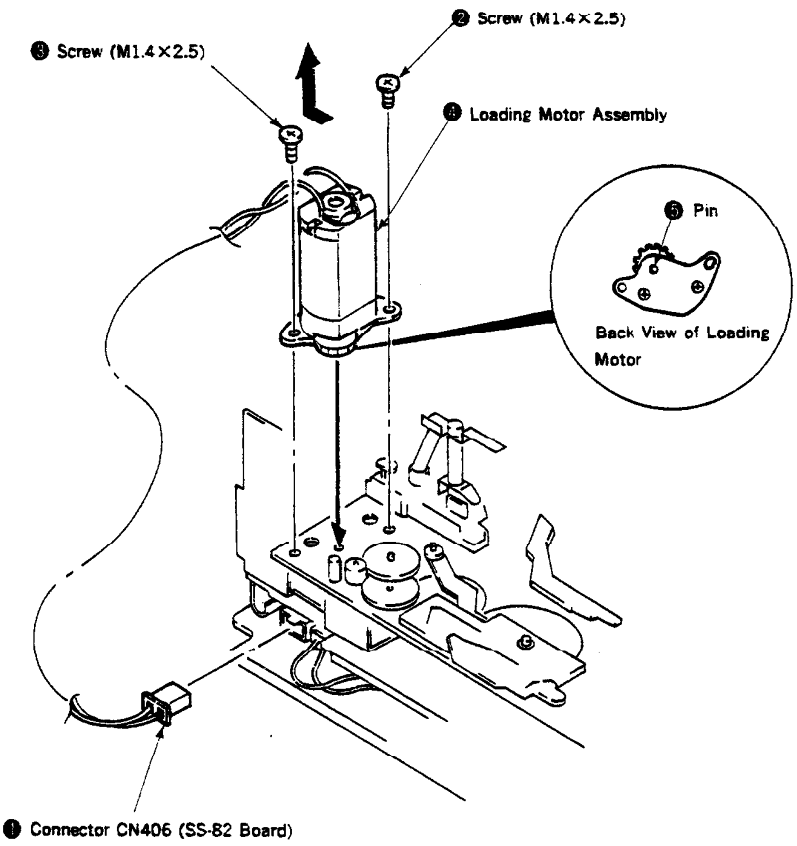

❷ Screw (M1.4×2.5)
❸ Screw (M1.4×2.5)
❹ Loading Motor Assembly
❺ Pin
Back View of Loading Motor
❶ Connector CN406 (SS-82 Board)

Fig. 38

3-18 GUIDE RAIL BASE 1 ASSEMBLY (Fig. 39)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Unskate the LS chassis a little.
3) Remove the two screws ●, and then, guide rail base 1 assembly ●.

Note : Be careful not to lose the spacers inserted in the parts ⓐ and ⓑ of the guide rail base 1 assembly ●. (Fig. B)

2. Mounting

1) Apply half a drip each of molyton grease at 2 places on the back of the guide rail base 1 assembly. (Fig. A)
2) Put the pin ● of the guide rail base 1 assembly ● in the notch of the chassis, and tighten the two screws ● with a torgue of 0.6kg•cm.
3) Referring to 1-1, mount the cassette compartment holder assembly.

Note1 : Mount paying attention to the number of spacers inserted and their locations.

Note2 : When tightening the screws, be careful not to bend the TG-2 upper flange ● with a screwdriver bit.

Note3 : Note that the part c of the guide rail base 1 assembly is easily broken. (Fig. B)

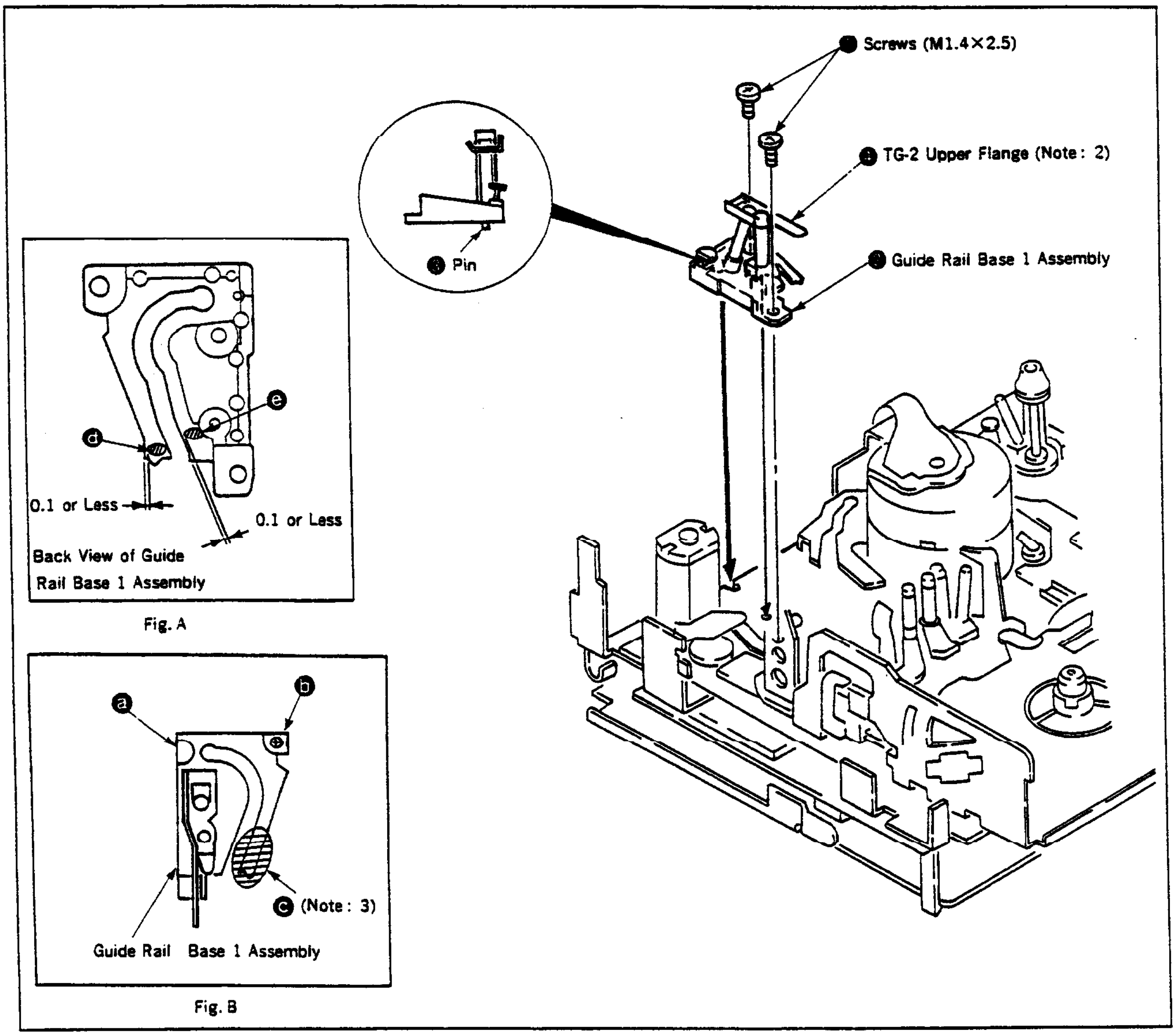

● Screws (M1.4×2.5)
● TG-2 Upper Flange (Note: 2)
● Guide Rail Base 1 Assembly
● Pin
ⓓ
ⓔ
0.1 or Less
0.1 or Less
Back View of Guide Rail Base 1 Assembly
ⓐ
ⓑ
ⓒ (Note: 3)
Guide Rail Base 1 Assembly

Fig. A

Fig. B

図39.

3-19 GUIDE RAIL BASE 2 ASSEMBLY (Fig. 40)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to the Service Manual, open the board in the back of the mechanical chassis.
3) Remove the four screws ●, and then, frame B assembly ● in a direction of the arrow Ⓐ.
4) Unskate the LS chassis a little.
5) Remove the two screws ●, and then, guide rail base 2 assembly ● in a direction of the arrow Ⓑ.

Note : Be careful not to hit the drum with a screwdriver bit because the screws are located closed to a drum lead.

2. Mounting

1) Apply half a drip of molyton grease each to 4 places on the back of the guide rail base 2 assembly. (Fig. A)
2) As shown in Fig. B, apply the striking parts of the guide rail base 2 assembly ● to the lower drum, and slide in an arrow direction to fit.
3) Pushing the part ✻ of the guide rail base 2 assembly ● lightly in a direction of ⓔ (Fig. B), tighten the two screws ● with a torque of 0.8kg•cm.

Note : Note that the part f is easily broken.

4) Mount the frame B assembly with the four screws ●.
5) Mount the opened board to the back of mechanical chassis.
6) Referring to 1-1, mount the cassette compartment holder assembly.

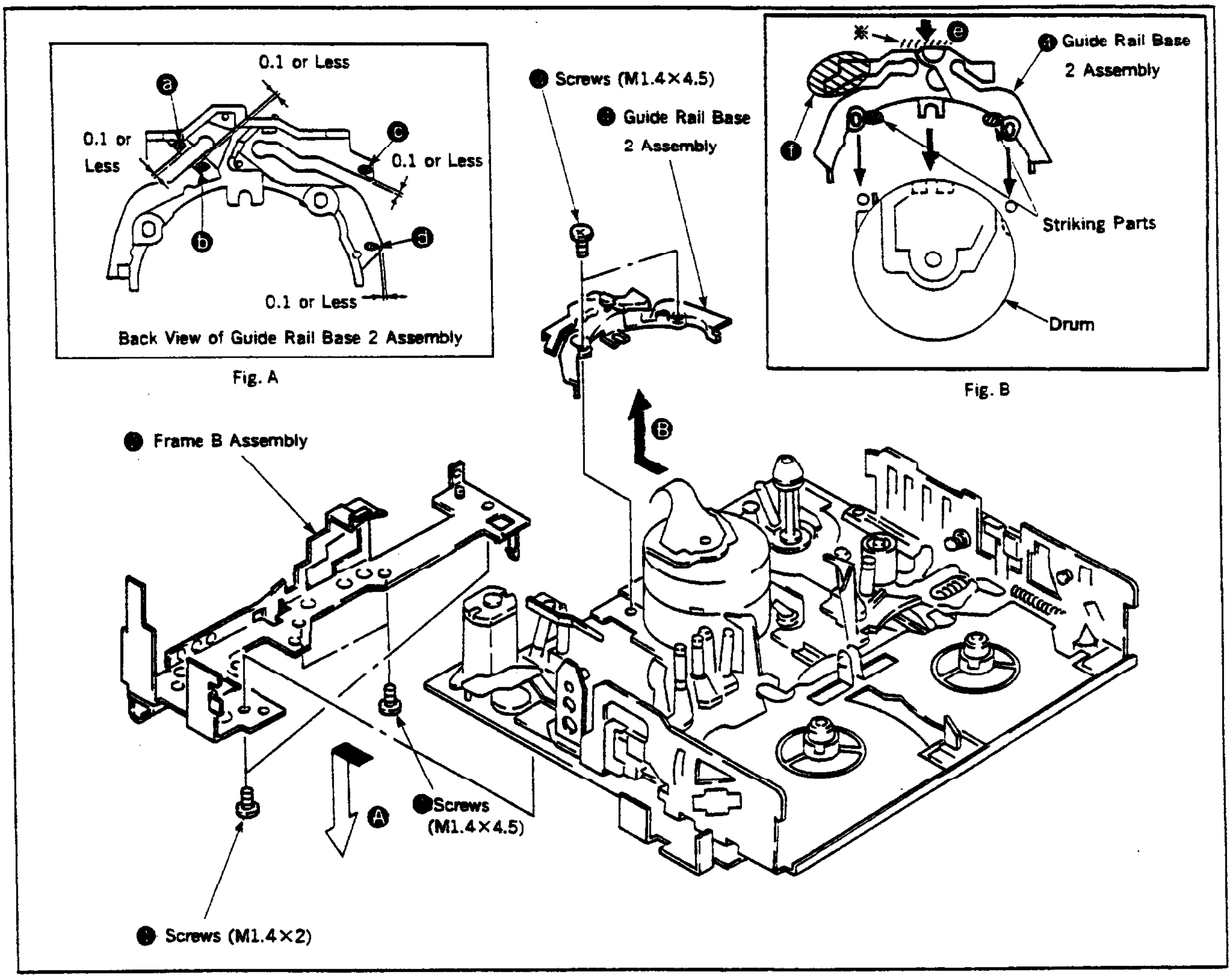

0.1 or Less
ⓐ
0.1 or Less
ⓒ
0.1 or Less
ⓑ
ⓓ
0.1 or Less
Back View of Guide Rail Base 2 Assembly
Fig. A
● Screws (M1.4×4.5)
● Guide Rail Base 2 Assembly
✻
ⓔ
● Guide Rail Base 2 Assembly
ⓕ
Striking Parts
Drum
Fig. B
● Frame B Assembly
Ⓑ
Ⓐ
●Screws (M1.4×4.5)
● Screws (M1.4×2)

Fig. 40

3-20 GUIDE RAIL BASE 3 ASSEMBLY (Fig. 41)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Remove the flexible rotatry shaft ❸.
3) Remove the two screws ❶. Remove the guide rail base 3 assembly ❷ in an arrow direction, seeing to it that it does not hitch on the capstan housing.

Note : Handle the ⋇ marked part carefully because it is easily broken.

2. Mounting

1) Apply half a drip of molyton grease each to 2 places on the back of the guide rail base 3 assembly ❷. (Fig. A)
2) Mount the guide rail base 3 assembly ❷, seeing to it that it does not hitch on the capstan housing.
3) Tighten the two screws ❶ with a torque of 0.6kg•cm.
4) Mount the flexible rotary shaft ❸.
5) Referring to 1-1, mount the cassette compartment holder assembly.

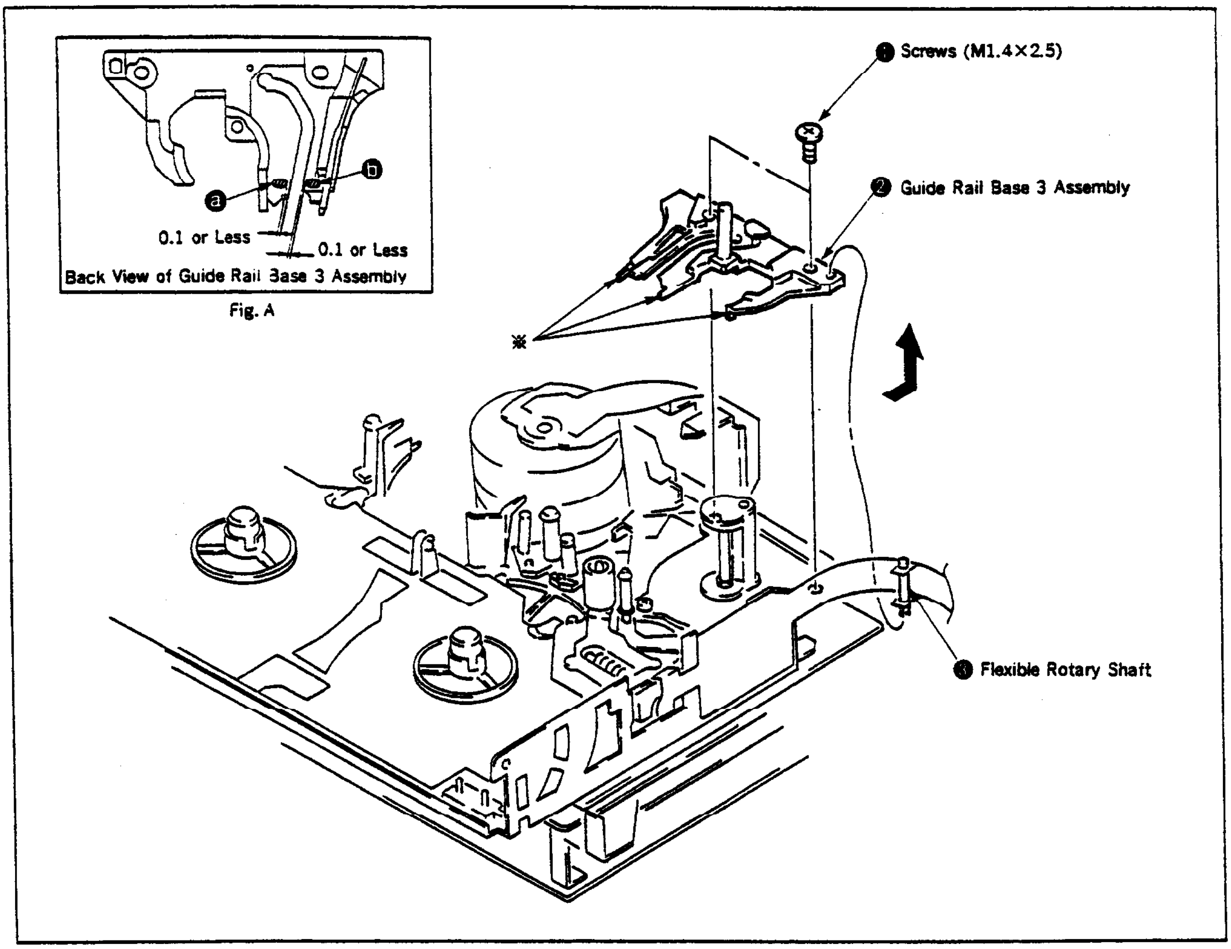

ⓐ
ⓑ
0.1 or Less
0.1 or Less
Back View of Guide Rail Base 3 Assembly
Fig. A
❶ Screws (M1.4×2.5)
❷ Guide Rail Base 3 Assembly
⋇
❸ Flexible Rotary Shaft

Fig. 41

3-21 CAPSTAN MOTOR ASSEMBLY (Fig. 42)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-20, remove the guide rail base 3 assembly.
3) Remove the connector ❷ of the capstan motor assembly ❶.
4) Remove the screw ❸. Disengaging the gear of the conversion gear assembly ❹, remove the capstan motor assembly ❶ in an arrow direction (obliquely).

2. Mounting

1) As shown in Fig. A, incline the capstan motor assembly ❶ to engage the gear of the capstan motor assembly ❶ with that of the conversion gear assembly ❹, and tighten the screw 3 with a torque of 1kg•cm.

   When this is done, be careful not to damage the gear of the conversion gear assembly ❹.
2) Mount the connector 2 to the capstan motor assembly ❶.
3) Referring to 3-20, mount the guide rail base 3 assembly.
4) Referring to 1-1, mount the cassette compartment holder assembly.

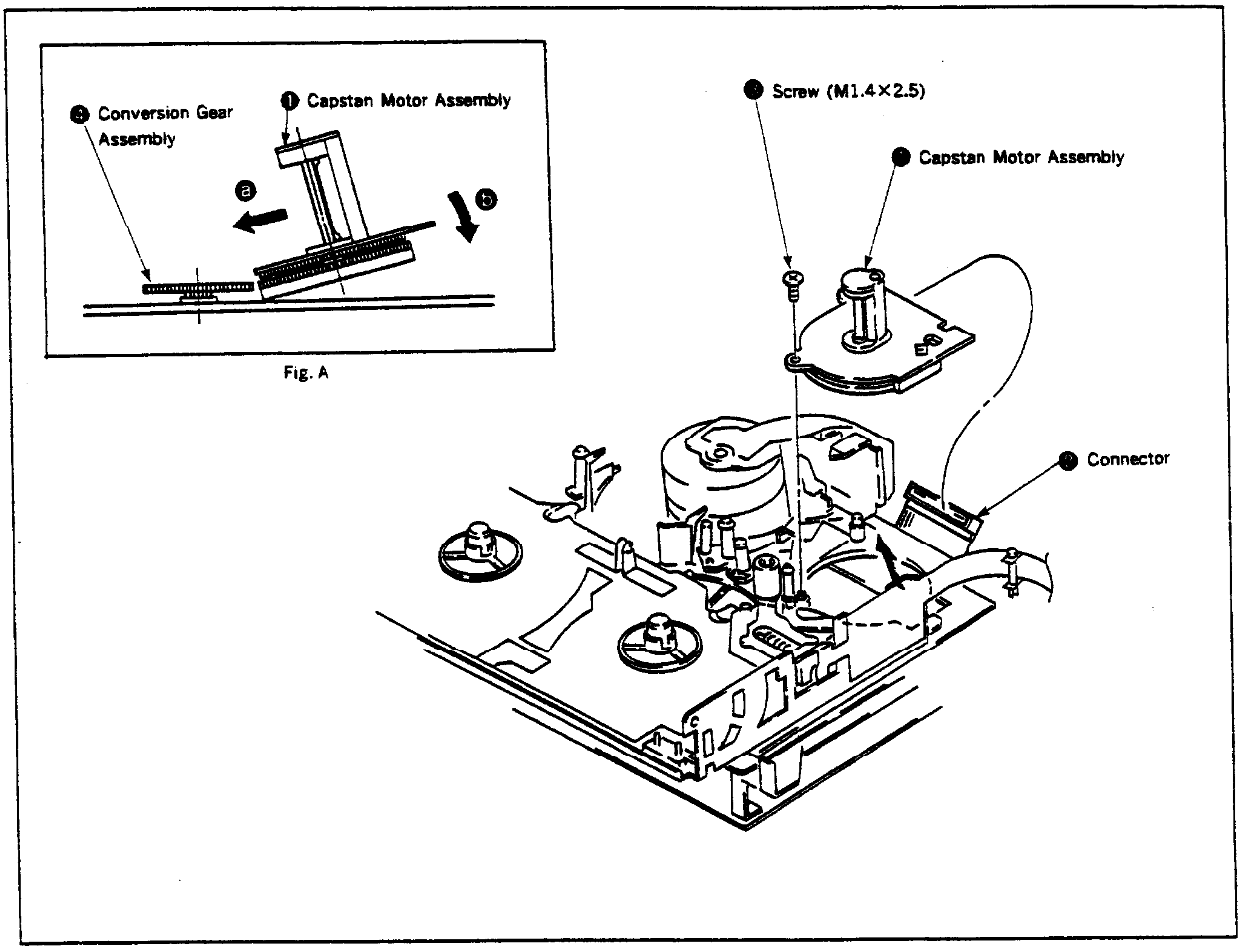

❹ Conversion Gear Assembly
❶ Capstan Motor Assembly
ⓐ
ⓑ
Fig. A
❸ Screw (M1.4×2.5)
❶ Capstan Motor Assembly
❷ Connector

Fig. 42

3-22 DRUM BASE ASSEMBLY (Fig. 42)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Remove the motor flexible board ● from the board.
3) Referring to 3-19, remove the guide rail base 2 assembly.
4) Remove the two screws ●.
5) Draw out the head flexible board ● carefully from the hole of the mechanical chassis not to damage it, and remove the drum base assembly.

2. Mounting

1) Put the head flexible board ● in the hole of the mechanical chassis and put the positioning pins ● of the drum base in the holes of the mechanical chassis.
2) Tighten the two screws ● with a torque of 0.8kg•cm.
3) Referring to 3-19, mount the guide rail base 2 assembly.
4) Mount the motor flexible board ● to the board.
5) Referring to 1-1, mount the cassette compartment holder assembly.

Note : After mounting, make tape path adjustment in Section 4.

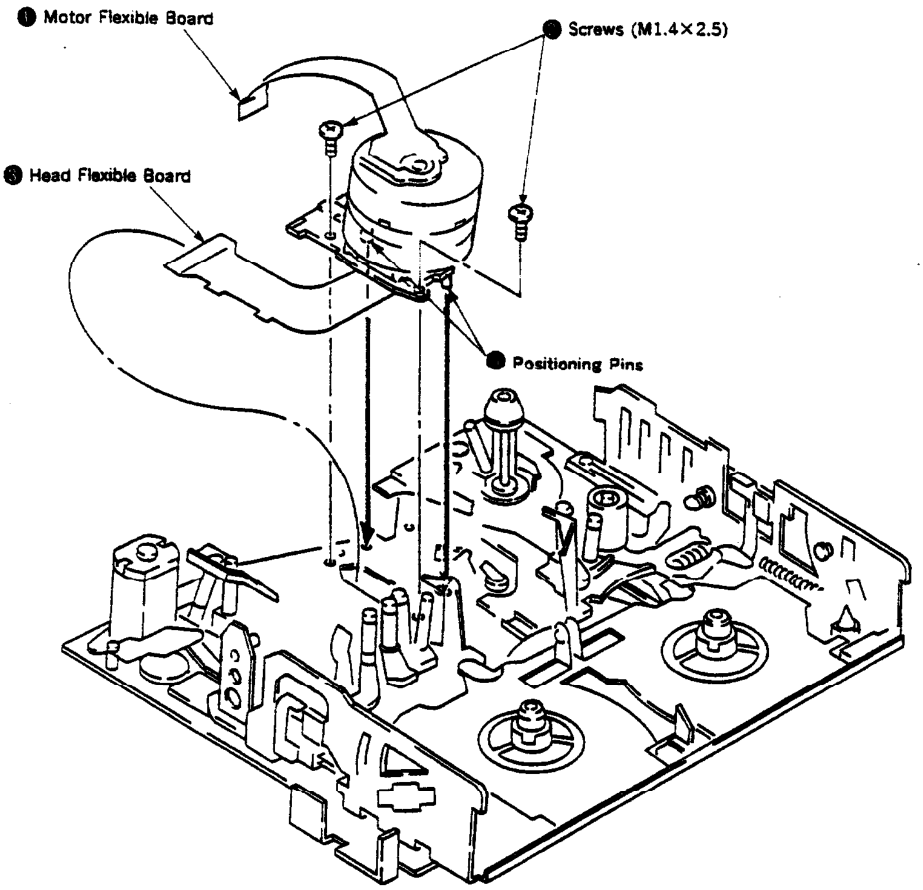


Fig. 42

3-23 DRUM ASSEMBLY (Fig. 43)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Remove the motor flexible board ❶ from the board.
3) Referring to 3-19, remove the guide rail base 2 assembly.
4) Remove the three screws ❷ from the back of the mechanical chassis.
5) Draw out the head flexible board ❸ carefully from the hole of the mechanical chassis not to damage it, and remove the drum assembly ❹.

2. Mounting

1) Put the head flexible board ❸ in the hole of the mechanical chassis, and mount it so that the pins ⓑ and ⓓ will be put in the holes ⓐ and ⓒ shown in Fig. A.
2) Tighten the three screws ❷ with a torque of 0.5kg•cm.
3) Referring to 3-19, mount the guide rail base 2 assembly.
4) Mount the motor flexible board ❶ to the board.
5) Referring to 1-1, mount the cassette compartment holder assembly.

Note : After mounting, make tape path adjustment in Section 4.

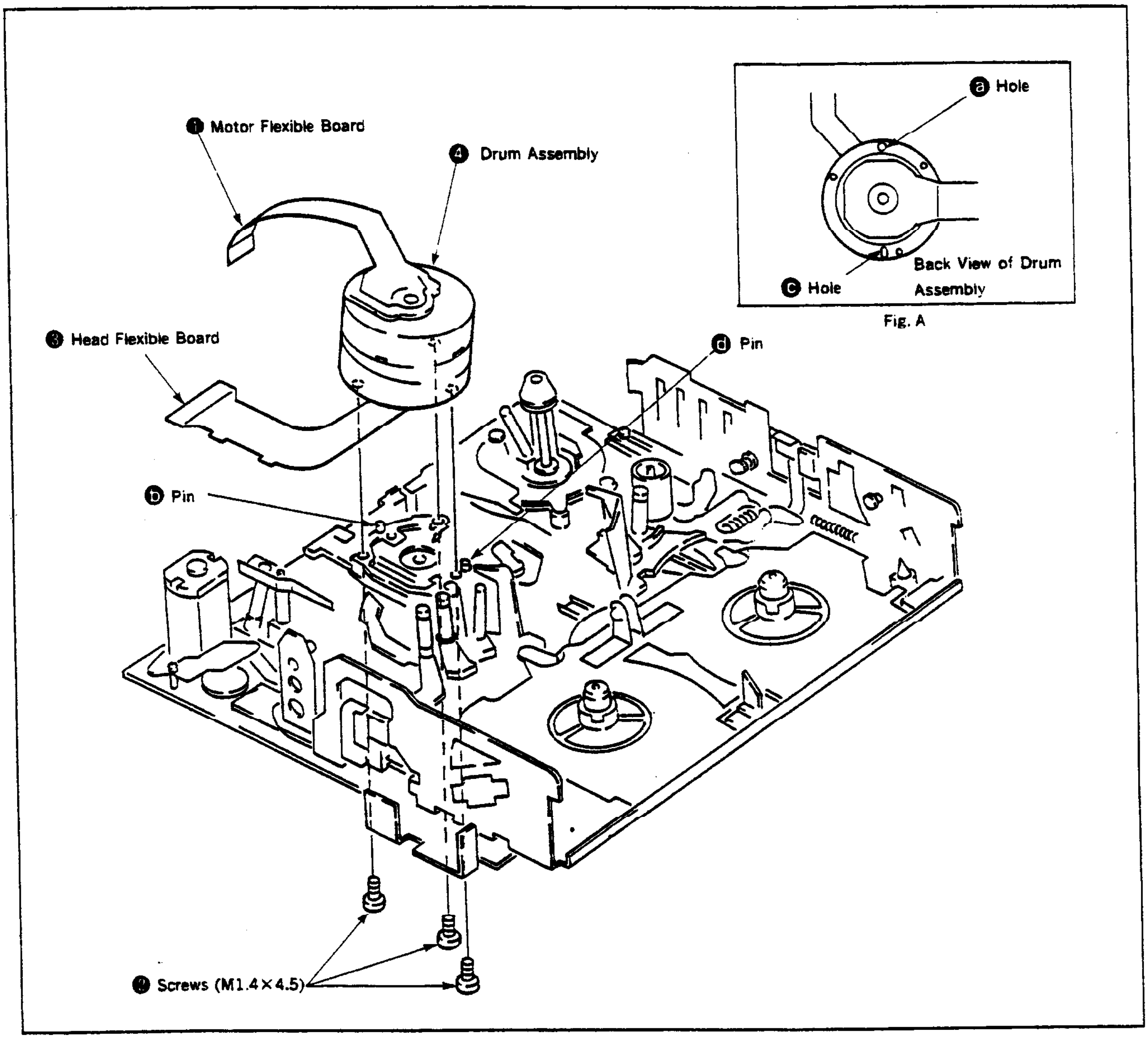
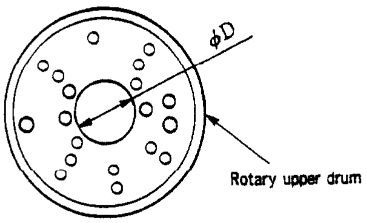

❶ Motor Flexible Board
❹ Drum Assembly
❸ Head Flexible Board
ⓑ Pin
ⓓ Pin
❷ Screws (M1.4×4.5)
ⓐ Hole
ⓒ Hole
Back View of Drum Assembly
Fig. A

Fig. 43

3-24 Replacement of Rotary Upper Drum Assembly

There are two rotary upper drum assembly types, depending on a color mark. (Fig. A in Fig. 45)



NTSC:

A-7049-190-A	Rotary upper drum assembly DGR-32-R-(1)
A-7049-189-A	Rotary upper drum assembly DGR-32-R-(2)

PAL:

A-7049-197-A	Rotary upper drum assembly DGR-37-R-(1)
A-7049-198-A	Rotary upper drum assembly DGR-37-R-(2)

Manufacturing upper dram

RANK	ϕD	MARK	
A	$\phi 8^{+0.0015}_{+0.001}$	Green	−01
B	$\phi 8^{+0.001}_{+0.0005}$	Green, Brown	
C	$\phi 8^{+0.0005}_{0}$	Black	
D	$\phi 8^{0}_{-0.0005}$	Black, Brown	
E	$\phi 8^{-0.0005}_{-0.001}$	Red	−11
F	$\phi 8^{-0.001}_{-0.0015}$	Red, Brown	
G	$\phi 8^{-0.0015}_{-0.002}$	Blue	
H	$\phi 8^{-0.002}_{-0.0025}$	Blue, Brown	

Repairing upper drum

SUFFIX	ϕD	REMARKS	DRUM UPPER
−01	$\phi 8^{+0.001}_{+0.0005}$	Green, Brown	NTSC DGR-32-R-(1) PAL DGR-37-R-(1)
	$\phi 8^{+0.0005}_{0}$	Black	
−11	$\phi 8^{-0.001}_{-0.0015}$	Red, Brown	NTSC DGR-32-R-(2) PAL DGR-37-R-(2)
	$\phi 8^{-0.0015}_{-0.002}$	Blue	

1. Removal

1) Referring to 3-23, remove the drum assembly.
2) Remove the two screws ●. (Fig. 44)
3) Hold the outlet (base) of the guide protector ●, lift it up obliquely. In that state, hold the outer figure of the back yoke ● and remove it. (Fig. 44)

Note : Note that the flexible board and guide protector ● easily come off position because they are only pasted.

4) As shown in Fig. A, set the rotor earth spring ● around spring hook. (Fig. 44)
5) Using a drum screwdriver (Ref. No. J-11), remove the two hexagon socket bolts ●, and then, rotary upper drum assembly ●. (Fig. 45)
6) Using the drum screwdriver (Ref. No. J-11), remove the two hexagon socket bolts ●, and then, rotor ●. (Fig. A in Fig. 45)

2. Mounting

1) Clean the flange surface●and the surface of the rotary upper drum assembly ● which comes into contact with it, and make sure that there is no dust or scratch. (Fig. 45)
2) Adjust a direction of the upper drum so that the head contact mold pin●will be put in the reference hole of the rotary upper drum assembly ●, and push it in lightly. (Fig. 45)

Note : Check visually that the clearance between the upper and lower drums is about 0.05mm.

3) Using the drum screwdriver (Ref. No. J-11), tighten the two hexagon socket bolts ● (800g•cm) and rotate it with finger to make sure that there is no abnormality. (Fig. 45)
4) Put the pin ● of the rotor ● in the hole of the rotary upper drum assembly. Using the drum screwdriver (Ref. No. J-11), tighten the hexagon socket bolts ●. (800g•cm) (Fig. A in Fig. 45)
5) Remove the rotor earth spring ● from the spring hook. Using tweezers, etc., hook it onto the groove of the stator boss●. (Fig. B in Fig. 45)

Note : See to it that the rotor earth spring ● is not located in the gap between the flange and stator.

6) Hold the outer figure of the back yoke ●, put it on the inner step of the upper drum and insert the other side slowly. (Fig. B in Fig. 44)
7) Tighten the two screws ●. (500g•cm) (Fig. 44)
8) Rotate the upper drum with finger to check that it runs smoothly.
9) Referring to 3-23, mount the drum assembly.

Note : After mounting, be sure to make tape path adjustment in Section 4.

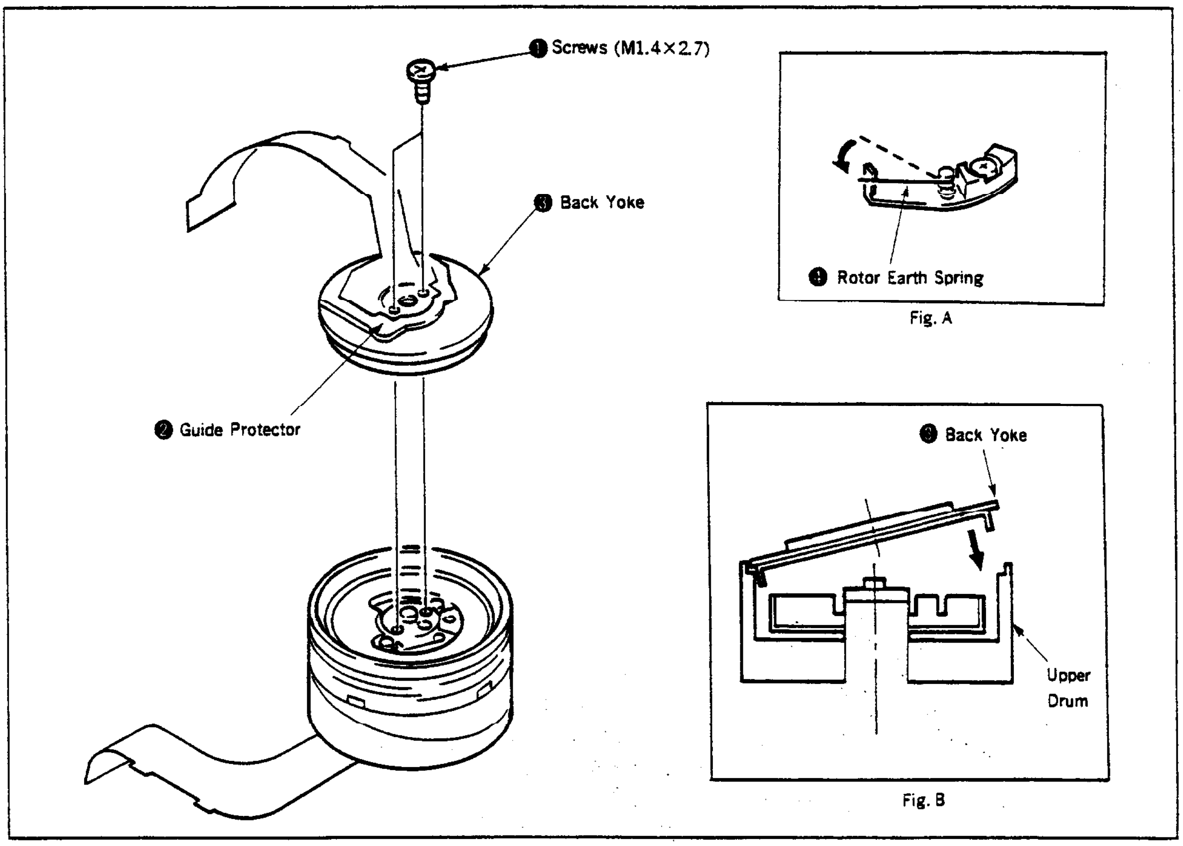

❶ Screws (M1.4×2.7)
❸ Back Yoke
❷ Guide Protector
❹ Rotor Earth Spring
❸ Back Yoke
Upper Drum

Fig. A

Fig. B

Fig. 44

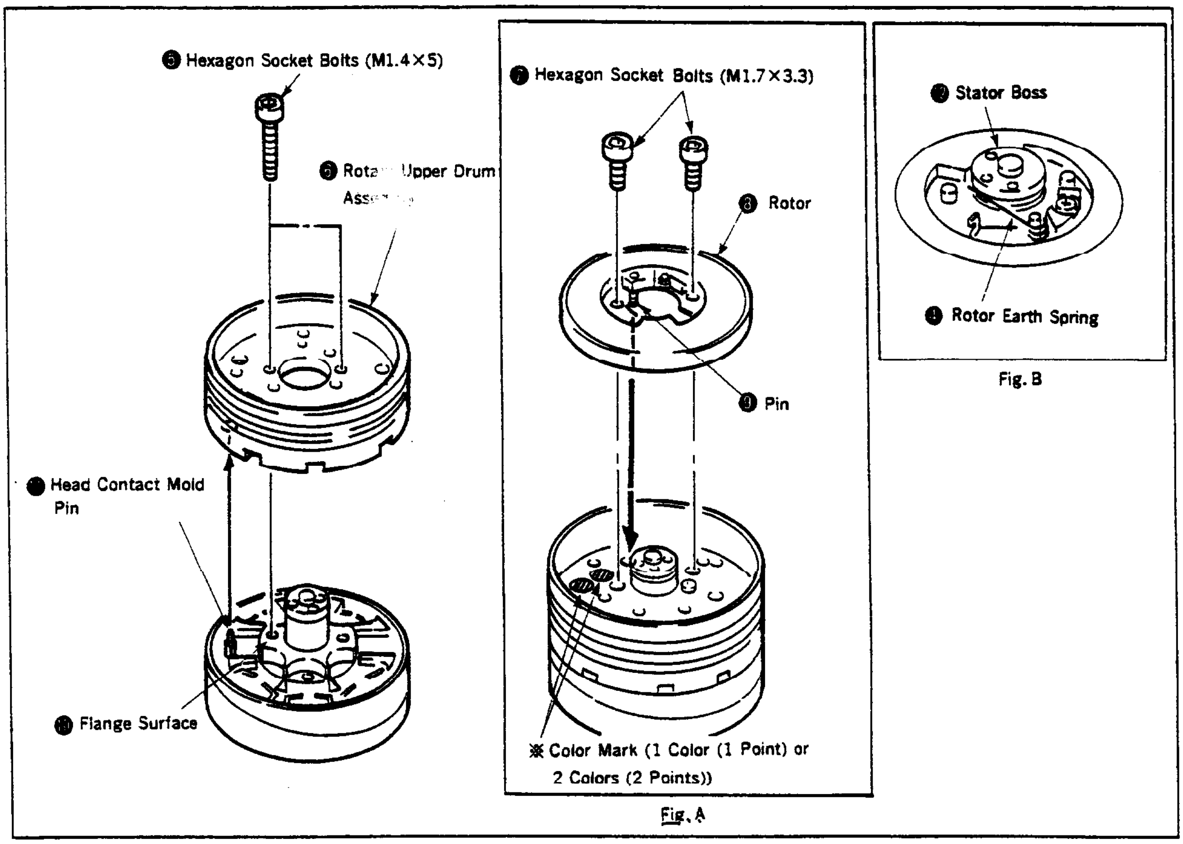

❺ Hexagon Socket Bolts (M1.4×5)
❻ Rotary Upper Drum Assembly
● Head Contact Mold Pin
❿ Flange Surface
❼ Hexagon Socket Bolts (M1.7×3.3)
❽ Rotor
❾ Pin
※ Color Mark (1 Color (1 Point) or 2 Colors (2 Points))
⓬ Stator Boss
❹ Rotor Earth Spring

Fig. A

Fig. B

Fig. 45

5 REEL TABLE HEIGHT CHECK (Fig. 46)

Removal

Referring to 1-1, remove the cassette compartment holder assembly.

Referring to 3-1, remove the LED base.

Check

Using slide calipers, etc., check that distances from the LS chassis to the S reel table reel resting surface ❷ and T reel table reel resting surface ❸ are ~~3.2±0.5mm~~ respectively.

3. Mounting

1) Referring to 3-1, mount the LED base.
2) Referring to 1-1, mount the cassette compartment holder assembly.

changed values

A:$3.2^{+0.2}_{-0.15}$mm

B:3.2±0.15mm

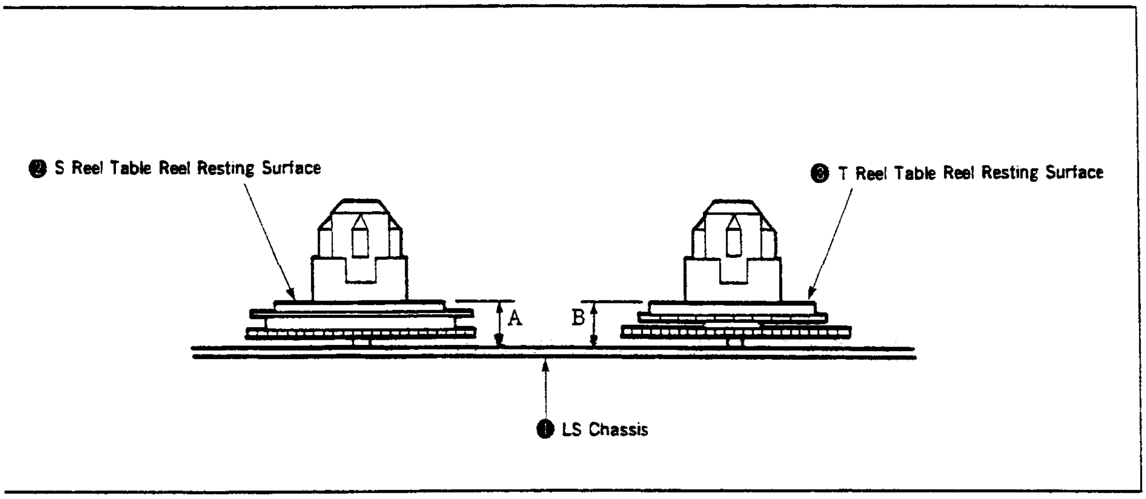

❷ S Reel Table Reel Resting Surface
❸ T Reel Table Reel Resting Surface
A
B
❶ LS Chassis

Fig. 46

6 FWD/RVS TORQUE CHECK

Set the FWD/RVS take-up torque cassette (Ref. No. J-10).

In the FWD mode, check that a T reel torque value is ~~6g•cm — 16g•cm~~ ☛ **changed value** 5 – 15g•cm.

Turn on the REC/REVIEW button and check that an S reel torque value is 25g•cm – 45g•cm.

When the values above are not met, replace the respective reel tables.

3-27 TENSION REGULATOR POSITION ADJUSTMENT

1. Removal

1) Referring to 1-1, remove the cassette compartment holder.

2. Adjustment

1) Set a cassette tape, select the REC mode and run the tape. (Refer to 1-3)
2) With the tape running, check that the distance between TG-1 and TG-2 is ~~0.58±0.2mm~~ (Fig. 47)
3) When they are not at specified positions, remove the cassette and go through the steps 4) on.
4) Referring to 3-1, remove the LED base.
5) Loosen the screw ❶.

changed value

9.35 – 10.7mm.

6) When TG-1 is located inside (or outside) its specified position, shift the TG-1 adjustment block 2 slightly in a direction of the arrow Ⓐ (or Ⓑ) and fix with the screw ❶. (Fig. 48)
7) Referring to 3-1, mount the LED base.

Note : Use the cassette tape after feeding the tape as far as a middle point.

Note : When taking the steps 4) and 5), remove the cassette tape first.

Note : Check that TG1 is able to move in direction C during REC.

3. Mounting

1) Referring to 1-1, mount the cassette compartment holder assembly.

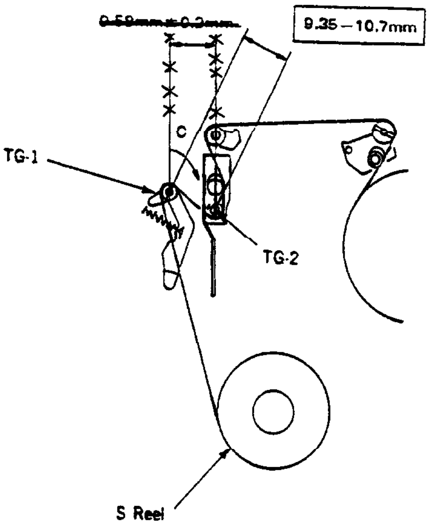


Fig. 47

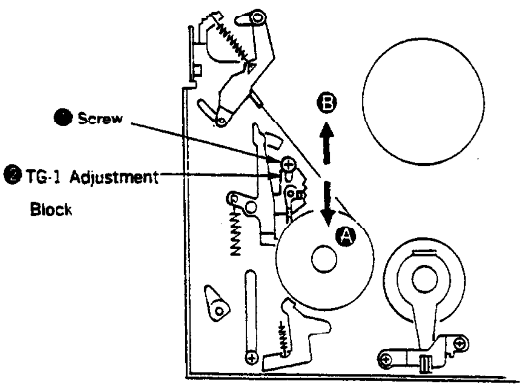


Fig. 48

3-28 FWD BACK TENSION ADJUSTMENT (Fig. 49)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-7, remove the LED base.

2. Adjustment

1) Select the REC mode.
2) Set the tension measurement reel (Ref. No. J-8)●.
3) Using the dial tension gauge (Ref. No. J-7)●, measure a tape tension at the outlet of TG-2. When this is done, pull the tape at a rate of 14mm/sec.
4) Change the position of the tention regulator spring ● position as shown in Fig. A so that measure center value of the tention is 4 g-6.5g.

Note : When this is done, see to it that the gear ● is not engaged with the S reel table.

3. Mounting

1) Referring to 1-1, mount the cassette compartment holder assembly.
2) Referring to 3-1, mount the LED base.

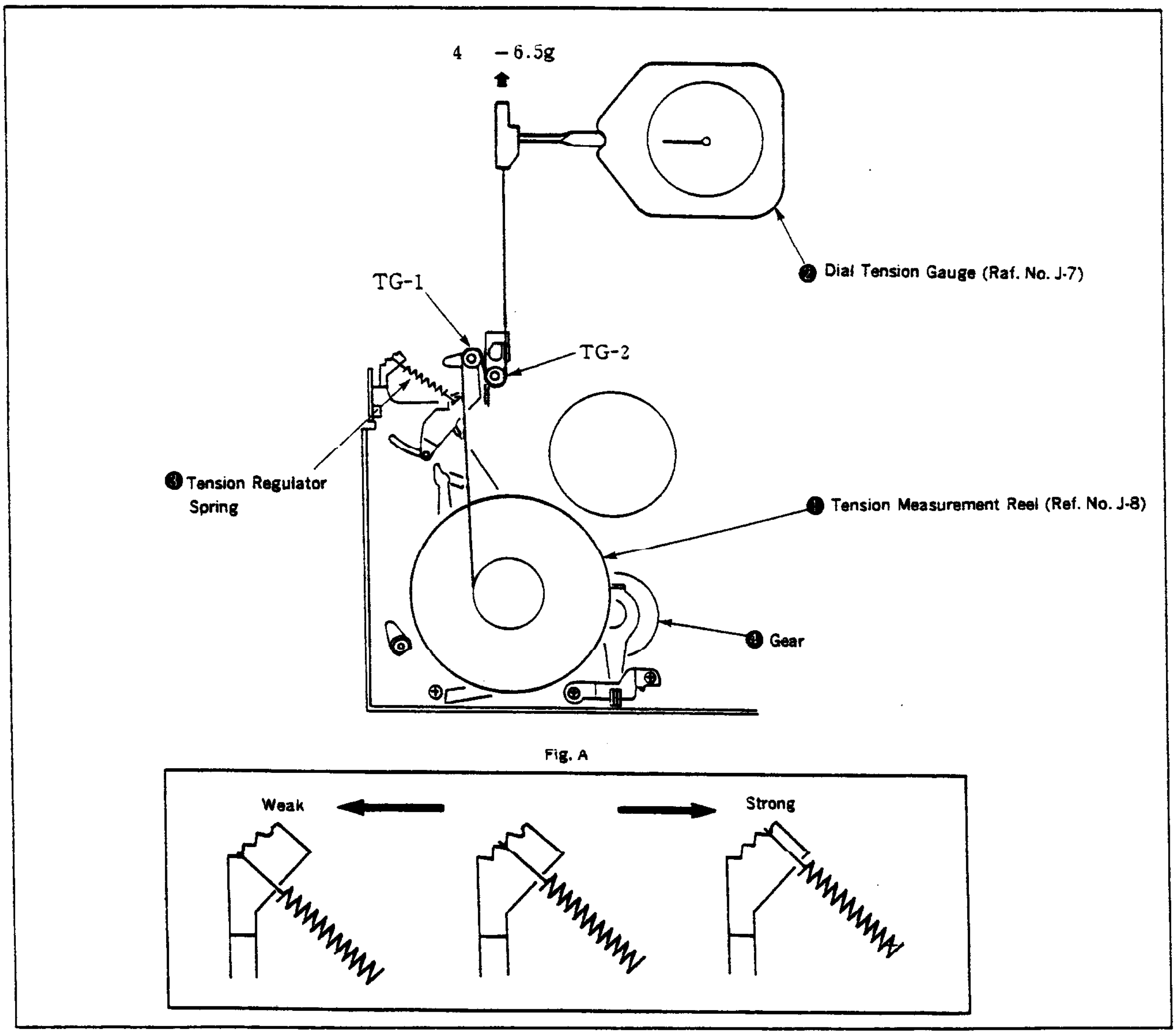

4 -6.5g
● Dial Tension Gauge (Raf. No. J-7)
TG-1
TG-2
● Tension Regulator Spring
● Tension Measurement Reel (Ref. No. J-8)
● Gear
Fig. A
Weak
Strong

Fig. 49

4. TAPE PATH ADJUSTMENT

The 8mm video system uses ATF (Automatic Track Finding) which instantaneously controls a tape running speed based on 4 types of pilot signals and performs high-precision tracking.

This does away a tracking control knob and allows accurate track tracing.

On the other hand, however, the ATF system has a problem in adjusting the tape path system. That is, if head tracing is out of order a little, the ATF system automatically corrects it, which means that perfect adjustment cannot be done.

To avoid this problem, a track shift jig had been used to adjust the tape path system. In the FL (Q) mechanism, the ATF system is forcibly operated to shift a tracking amount constantly (approx. 1/4) by setting the PATH mode. So, fine tracking adjustment can be easily done.

No track shift jig is required any more.

Example) For CCD-V11/V88

CN404

4	GND
3	CAM ADJ
2	TEST
1	PATH

The path mode is set by shorting the pins ① and ④.

4-1 PREPARATION FOR ADJUSTMENT

1) Clean the tape running surfaces (tape guides, drum, capstan shaft, pinch roller). (Fig. 51)
2) Set the PATH mode by shorting the TEST pins (CN404 pins ① and ④ for CCD-V11/V88).
3) Connect to an oscilloscope.
4) Play back a tracking alignment tape (NTSC: WR5-1N), (PAL: WR5-1C).
5) Check that a RF waveform is flat at the inlet and outlet of the oscilloscope. (Fig. 50 ⓐ)

   When it is not flat, make adjustment in accordance with the procedures below.

   When the RF waveform is not flat at the inlet/outlet; (Fig.50 ⓑ and ⓒ)

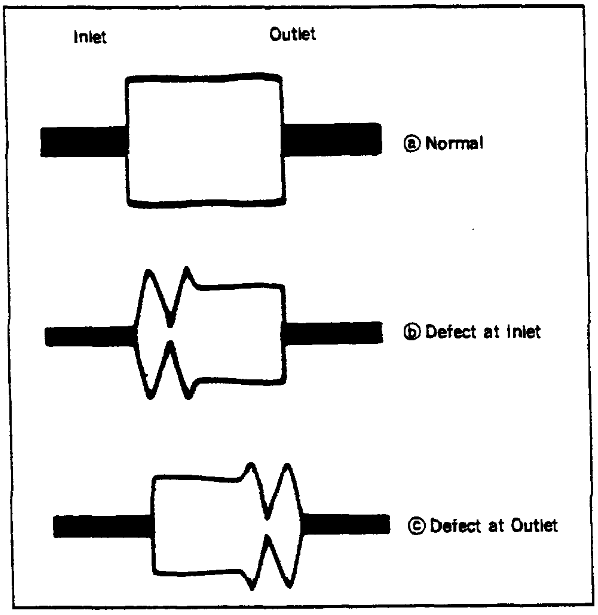

Inlet
Outlet
ⓐ Normal
ⓑ Defect at Inlet
ⓒ Defect at Outlet

Fig. 50

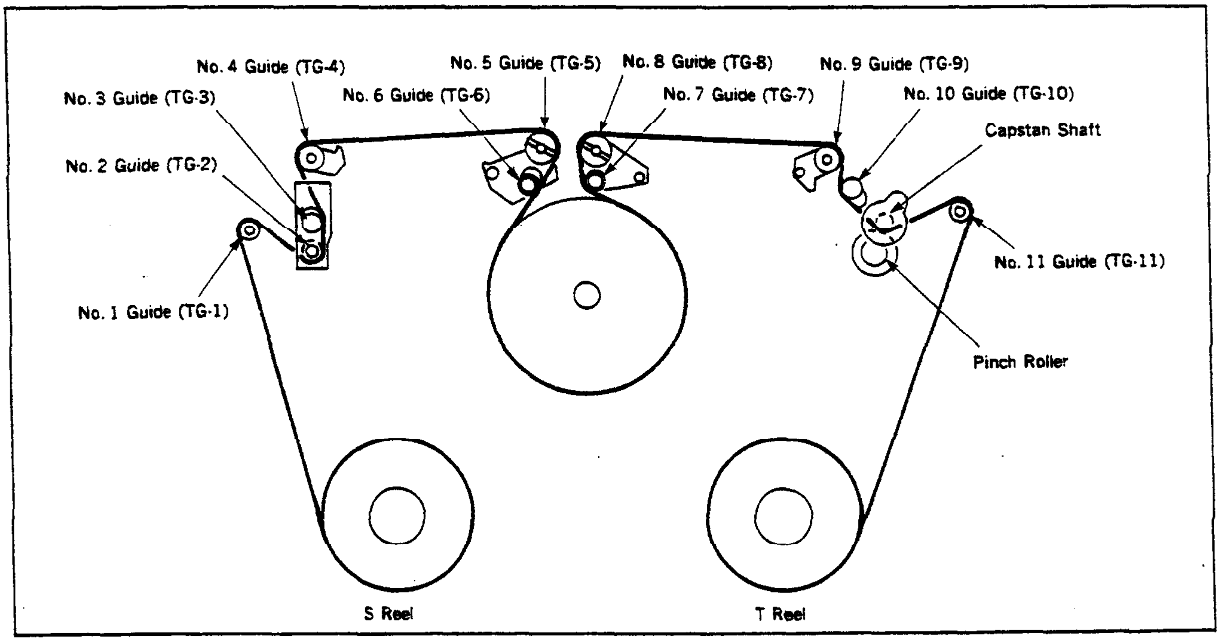

No. 4 Guide (TG-4)
No. 5 Guide (TG-5)
No. 8 Guide (TG-8)
No. 9 Guide (TG-9)
No. 3 Guide (TG-3)
No. 6 Guide (TG-6)
No. 7 Guide (TG-7)
No. 10 Guide (TG-10)
Capstan Shaft
No. 2 Guide (TG-2)
No. 11 Guide (TG-11)
No. 1 Guide (TG-1)
Pinch Roller
S Reel
T Reel

Fig. 51 Tape Guides Location

4-2 TRACKING ADJUSTMENT (Fig. 52)

1) Play back the tracking alignment tape.
2) Loosen the No. 5 guide (TG-5) lock screw ● and turn the No. 5 guide to flatten the waveform at the inlet.
3) Tighten the No. 5 guide (TG-5) lock screw ● to lock the No. 5 guide.
4) Loosen the No. 8 guide (TG-8) lock screw ● and turn the No. 8 guide to flatten the waveform at the outlet.
5) Tighten the No. 8 guide (TG-8) lock screw ● to lock the No. 8 guide. When this is done, make sure that the waveform does not change at the outlet.

Note : Be careful not to loosen the lock screw too much because the guide is easily moved.

Tape path Adjustment for "Guide Rail Base 2 with TG8 Gate Adjustment"

You do not have to adjust theTG-8 gate adjustment screw.

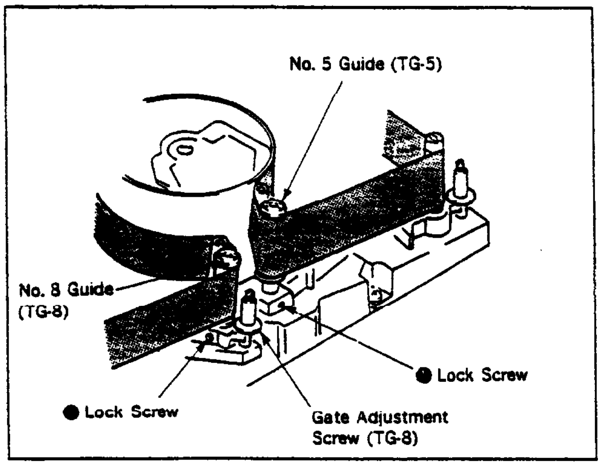


Fig. 52

4-3 NO. 4 GUIDE (TG-4) ADJUSTMENT

When an entire guide base is replaced, its height has been preste.

TG-4 Guide Height Presetting

1) With the top surface of the TG-4 guide leveled, rotate an upper flange by one turn. This is a preset height.

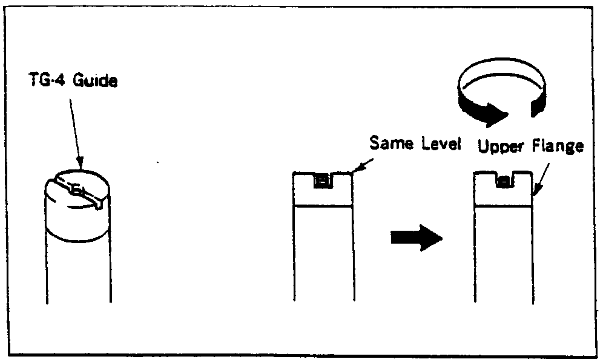


Fig. 53

No. 4 Guide (TG-4) Adjustment

1) Play back the tracking alignment tape.
2) In the FWD mode, check that the tape runs along a TG-4 lower flange. When there is a clearance, turn TG-4 counterclockwise to put the tape along the TG-4 lower flange. turning angle must be within 180°.
When this is done, check that a tracking waveform (Fig. 54) is not changed.
When a tracking waveform inlet is downward as shown in Fig. 55, make tracking adjustment at the inlet side by raising a height of TG-4.

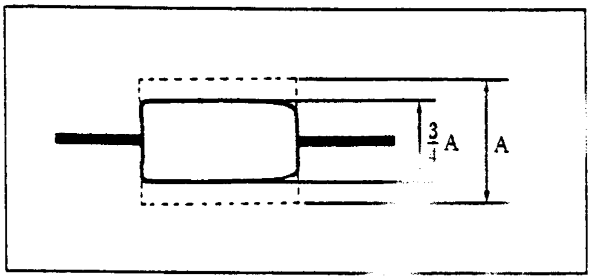


Fig. 54

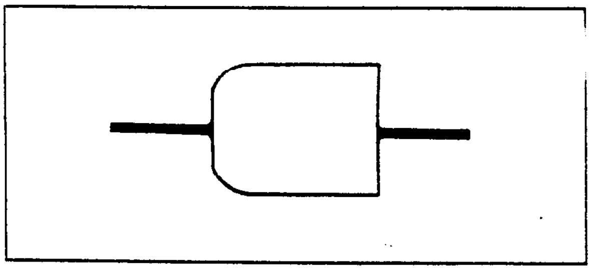


Fig. 55

Tape Path Adjustment for "Guide Rai[illegible] 1 with TG4 Gate Adjustment" (Fig. 56)

After adjusting an inlet, when the TG-4 lo[illegible]ge is curled in the REV mode, turn the TG-4 gate a[illegible]g screw at pitches of 45° to the left to remove a curl. ([illegible]ck screw is attached to the TG-4 gate adjusting screw. First, loosen the lock screw a little, and then, turn the gate adjusting screw. After adjustment, tighten the lock screw.)

If the TG-4 gate adjusting screw is turned to the left too much, the TG-2 upper flange (arrow-indicated part in the figure above) is greatly curled. If it happens, turn the screw to the right.

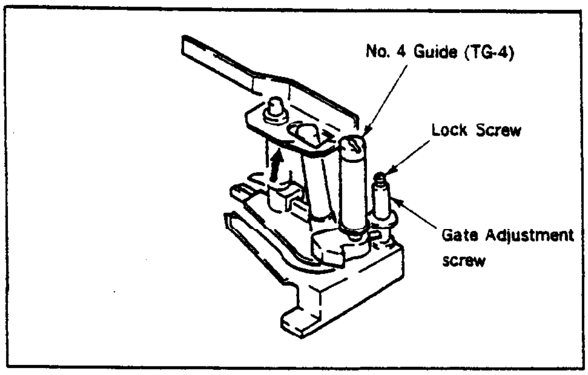


Fig. 56

4-4 NO. 11 GUIDE (TG-11) ADJUSTMENT

1) In the PLAY BACK mode, check that it has no deflection between the capstan and No. 11 guide (TG-11).
   (Criterion: 0.5mm or less)
   when the tape is deflected, turn the No. 11 guide (TG-11) to remove its deflection. (Fig. 57)
2) Select the REV mode and check the RF waveform at the outlet side. (Fig. 58)
3) If the waveform is defective, turn the TG-11 nut counterclockwise by 90° and recheck 2), 3) and 4).
4) Apply screw lock to the No. 11 guide (TG-11).

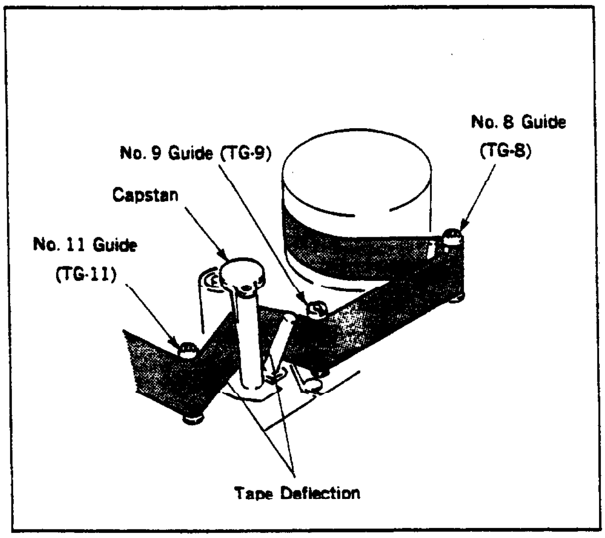

No. 8 Guide
(TG-8)
No. 9 Guide (TG-9)
Capstan
No. 11 Guide
(TG-11)
Tape Deflection

Fig. 57

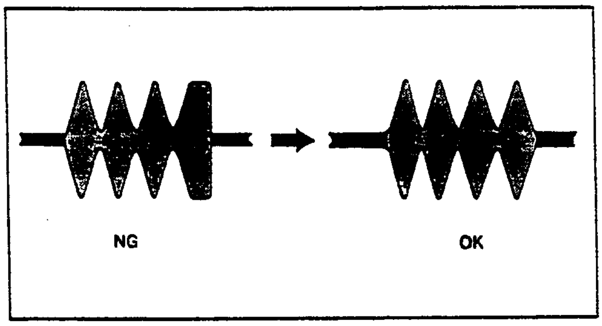


Fig. 58

4-5 CHECK AFTER ADJUSTMENT

1. Tracking Check

1) Play back the tracking alignment tape. In the PATH mode, shift a track. (Fig. 59)
2) At this time, check that a minimum amplitude value (E_{MIN}) is 67% or more of a maximum amplitude value (E_{MAX}). (Fig. 60)
3) Make sure that the waveform does not fluctuate greatly. (Fig. 61)

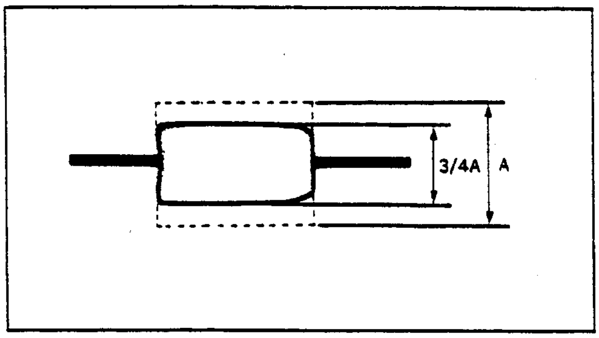


Fig. 59

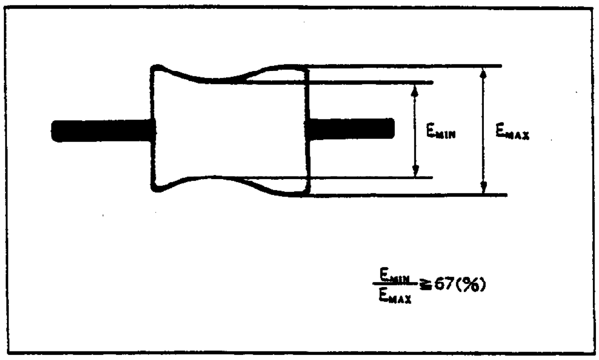


Fig. 60

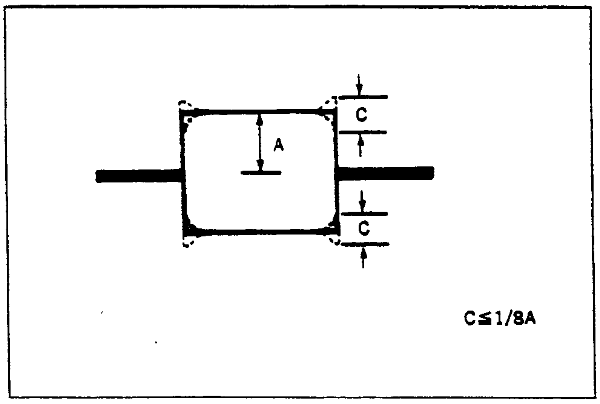


Fig. 61

2. CUE, REV Check

1) Play back the tracking alignment tape and select the REV mode. At this time, waveform peak pitches must be unform. (Fig. 62 ⓐ) When they not uniform, make tracking adjustment in 4-2 and No. 11 guide (TG-11) adjustment in 4-4.
2) Select the CUE mode. At this time waveform peak pitches must be uniform. (Fig. 62 ⓑ) When not uniform, make tracking adjustment in 4-2.

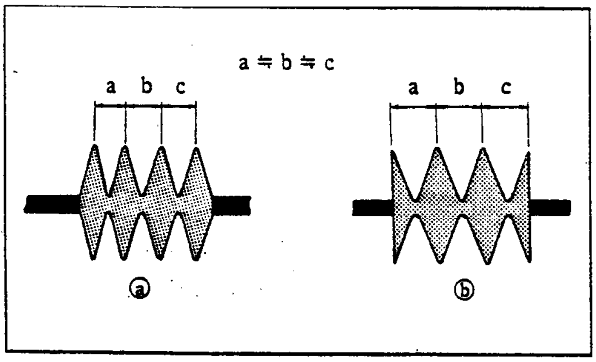


Fig. 62

3. Rise Check

1) Play back the tracking alignment tape.
2) In the PLAY BACK mode, check that the RF waveform rises horizontally within one second. At this time, check also that the tape is not deflected around the pinch roller. (Fig. 63)
3) Play back the tape after CUE/REV and FF/REW operation and check that the RF waveform rises horizontally within one second. At thistime, check also that the tape is not deflected around the pinch roller.
4) Repeat the checks in 2) and 3).

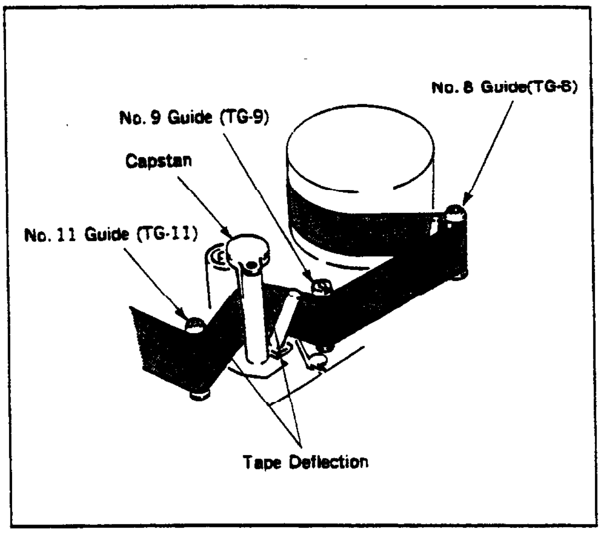

No. 8 Guide(TG-8)
No. 9 Guide (TG-9)
Capstan
No. 11 Guide (TG-11)
Tape Deflection

Fig. 63

4. Tape Running Check

In the CUE and REV modes, check that the TG-2 upper and lower flanges, TG-4 lower flange, TG-5 upper flange, TG-8 upper flange and TG-11 upper and lower flanges are not culed greatly. (Fig. 63)

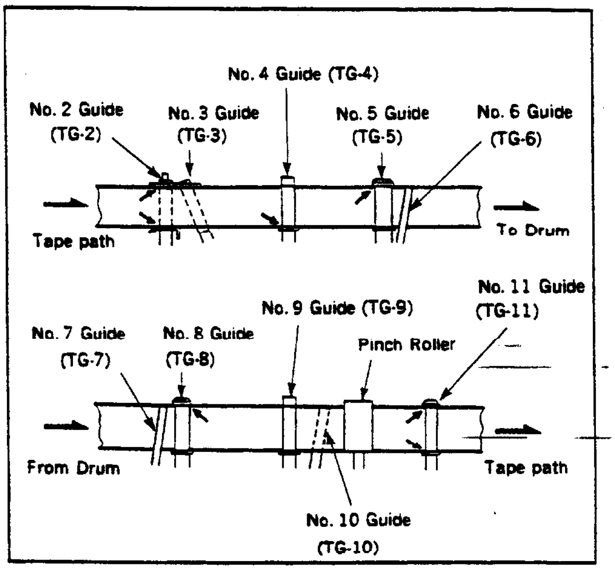
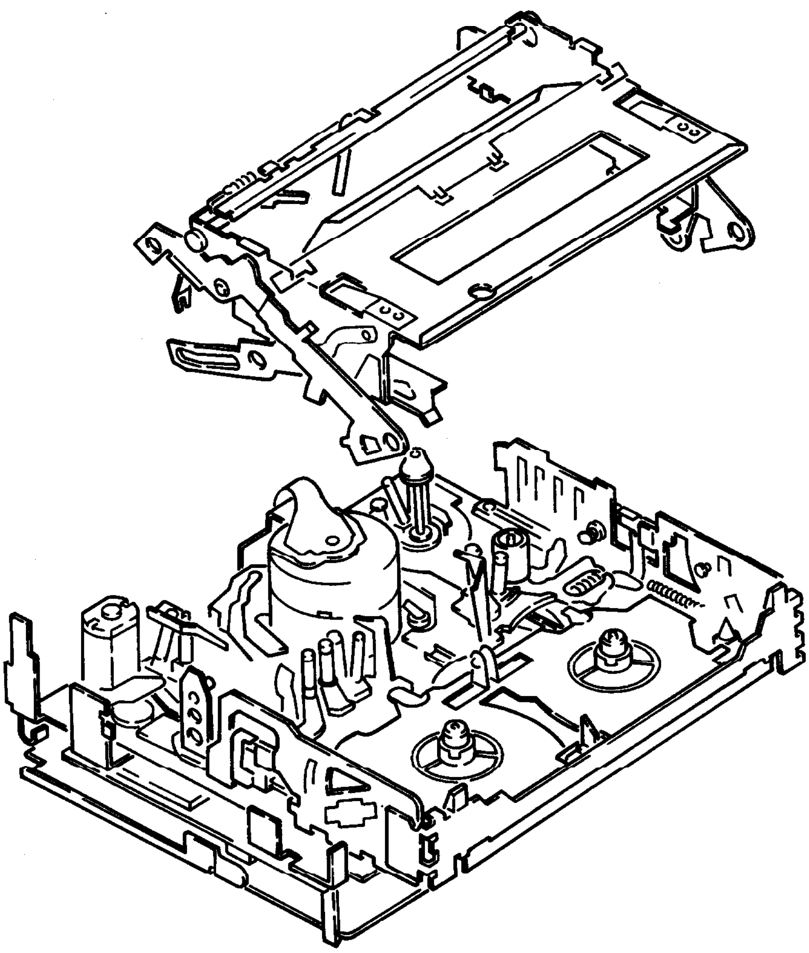

No. 4 Guide (TG-4)
No. 2 Guide (TG-2)
No. 3 Guide (TG-3)
No. 5 Guide (TG-5)
No. 6 Guide (TG-6)
Tape path
To Drum
No. 11 Guide (TG-11)
No. 9 Guide (TG-9)
No. 7 Guide (TG-7)
No. 8 Guide (TG-8)
Pinch Roller
From Drum
Tape path
No. 10 Guide (TG-10)

Fig. 64

8mm Video MECHANICAL ADJUSTMENT MANUAL II

FL MECHANISM (Q MECHANISM) Video 8

File with the SERVICE MANUAL



8 VIDEO RECORDER

SONY®

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1. PREPARATION FOR MECHANICAL CHECK, ADJUSTMENT AND MAINTENANCE

For removal of the cabinet and boards, refer to "Disassembly" in each Service Manual.
Mechanical adjustment is done in the USE mode. (To select the USE mode, refer to "1-4 Handling of Mode Selector".)

1-1 CASSETTE COMPARTMENT HOLDER ASSEMBLY (Fig. 1)

1. Removal

1) Select the USE mode.
2) Remove the screw ●, and then, the LS support ●.
3) Remove the four screws ●, and then, the LS frame assy ●.
4) Remove the three lock washers ●, and then, the washer ●, bar, joint ●, T protector assy ●, and TP arm assy ● in that order.
5) Remove the two screws●, and then, the two arm shafts A●.
6) Remove the shaft through the long hole●. With the cassette compartment holder assembly●rotated in a direction of the arrowⒶ, remove the long holes●and●from the shaft in that order, and then, remove the cassette compartment holder assembly●.
7) Slide the BS holder●in a direction of the arrow Ⓑ as shown in Fig. A and remove it in a direction of the arrowⒸ.

Note : When this is done, be careful not to drop the steel ball and spring, compression out of the BS holder ●.

2. Mounting

1) Select the USE mode.
2) Mount the BS holder●in the reverse order of its removal. Note: Refer to Fig. A.
3) Mount the shafts in the order of the long holes ●, ●and● of the cassette compartment holder assembly●, respectively.

Note : When this is done, rotate the cassette compartment holder assembly●in a direction of the arrowⒶ to mount it until the long hole is aligned with the oval shape of the shaft.

4) Align the oval shape of the two arm shafts A●with the long holes of the LS chassis, fit them in firmly and fix with the two screws●.
5) Mount the TP arm assy ●, T protector assy ● and bar, joint ●, respectively. Then, mount the washer ● and three lock washers ●.
6) Mount the LS frame assy ● to the chassis and fix with the four screws ●.
7) Mount the LS support ● to the chassis and fix with the screw ●.

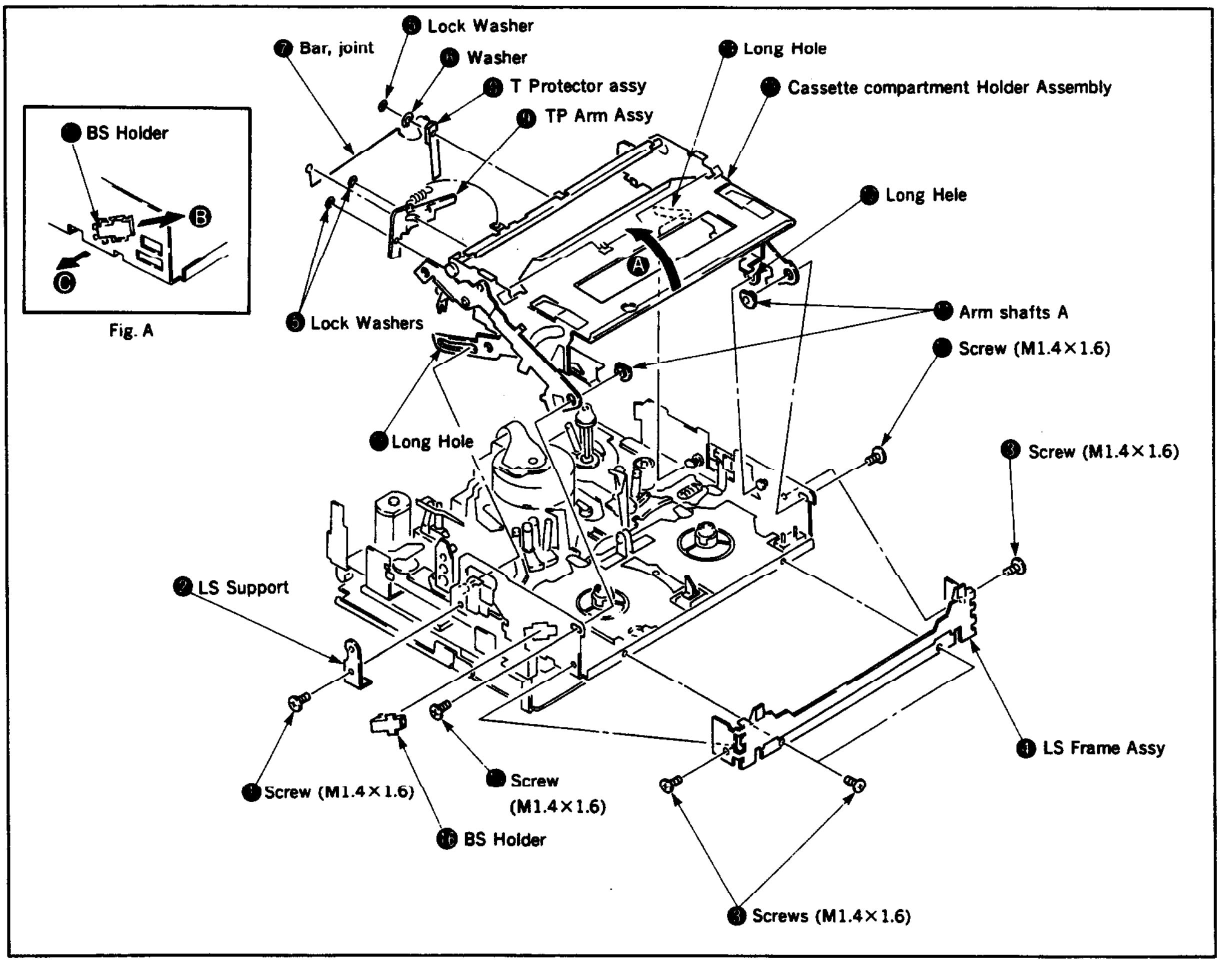

● Lock Washer
⑦ Bar, joint
● Washer
● T Protector assy
⑨ TP Arm Assy
● Long Hole
● Cassette compartment Holder Assembly
● BS Holder
Ⓑ
Ⓒ
Fig. A
● Long Hele
Ⓐ
● Lock Washers
● Arm shafts A
● Screw (M1.4×1.6)
● Long Hole
● Screw (M1.4×1.6)
● LS Support
● LS Frame Assy
● Screw (M1.4×1.6)
● Screw (M1.4×1.6)
● BS Holder
● Screws (M1.4×1.6)

Fig. 1

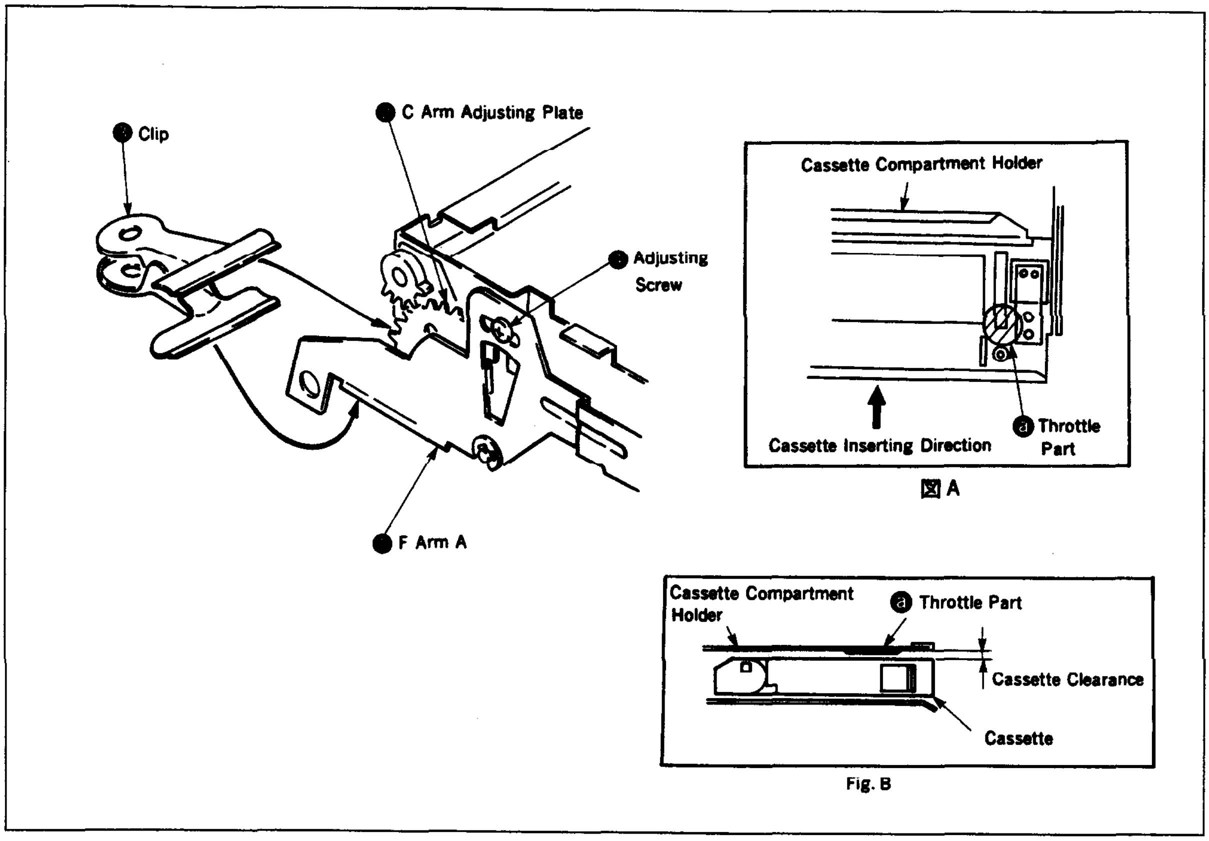
1-2 CASSETTE COMPARTMENT LOCK HEIGHT ADJUSTMENT (Fig. 2)

1) Using a spacer, etc., insert a 15.3mm-thick cassette to lock the cassette compartment.

Note : As shown in Fig. A, a 15.3mm-thick portion may be under the throttle partⓐ.

2) Pressing the partⓐ, nip the F arm A ● and the first tooth of the C arm adjusting plate ● with the clip ●, and tighten the adjusting screw ● at a torque of 1kg•cm.

3) Apply Screw Lock to the adjusting screw ● after making sure of the following clearances between the throttle partⓐ of the cassette compartment holder and the cassette as shown in Fig. B.
   - For 15mm-thick dummy cassette : 0.5 – 0.9
   - For 15.2mm-thick dummy cassette : 0.3 – 0.7


● Clip
● C Arm Adjusting Plate
● Adjusting Screw
● F Arm A
Cassette Compartment Holder
Cassette Inserting Direction
ⓐ Throttle Part
Cassette Compartment Holder
ⓐ Throttle Part
Cassette Clearance
Cassette

図A

Fig. B

Fig. 2

1-3 OPERATION WITH CASSETTE COMPARTMENT HOLDER ASSEMBLY REMOVED

1. Putting into Loading state (Fig. 3)

1) Referring to the Service Manual, supply power with the cabinet and camera section removed. (Make the mechanism deck ready to operate.)
2) Place the cap ● on the LED assembly ●.
3) Press the pin of the push switch ● (ON state) and fix it with adhesive tape ● in that state.
4) Press the locking plate release arm ● in an arrow direction. The set is made ready for loading.

2. Putting into the REC Mode

1) Short the TEST pins (SS-82 board CN404 pins ● and ● for CCD-V11/V88) to place into the TEST mode.

For CCD-V11/V88 ; SS-82 board CN404
TEST pin connector

4	GND
3	$\overline{\text{CAM ADJ}}$
2	$\overline{\text{TEST}}$
1	$\overline{\text{PATH}}$

The set is placed into the TEST mode by shorting the pins ● and ●.

2) After completing the step 1), set the power switch to VTR (or CAMERA).
3) Turn on the REC switch. (If the set is placed in the TEST mode, detection of S and T reel table rotation is disabled and the tape can run.)

3. Putting into EJECT

1) Turn on the EJECT switch.

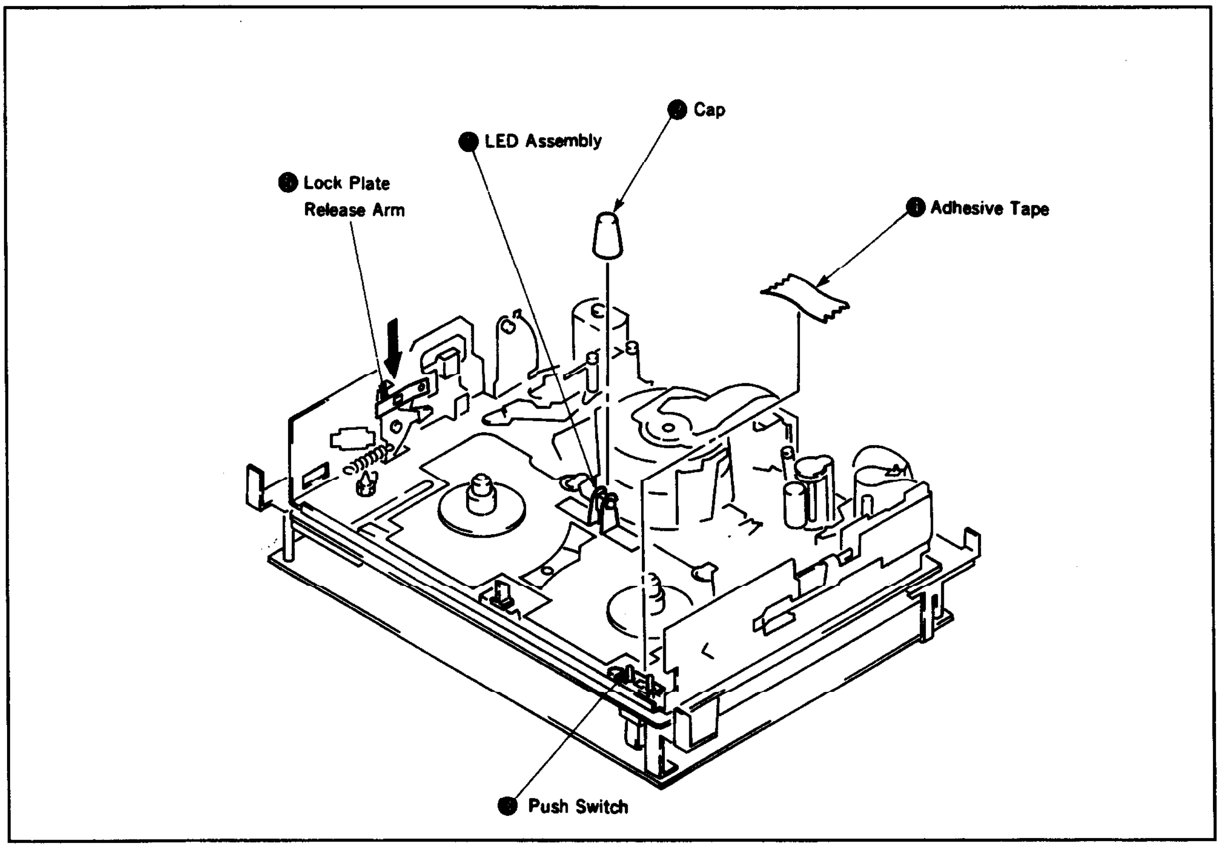


Fig. 3

1-4 HANDLING OF MODE SELECTOR

- Mount the MODE SELECTOR III panel to the mode selector. U, FL, O and O' mechanisms have different mode indications respectively. Select your disired type. (Fig. 4)

1. Construction (Fig. 5)

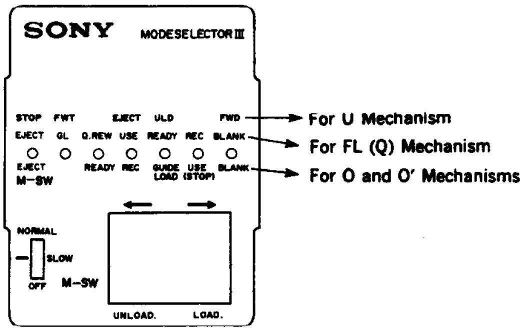
2. Connection (Fig. 6)

For CCD-VII/V88

1) Remove the plate, ornamental ●.
2) Remove the screw ●, and then, the LB-12 board ●.
3) Remove the FP-114 flexible connector ● and loading motor connector ●, and insert them into the MODE SELECTOR III conversion connector respectively.
4) Insert the M-SW connector of the mode selector into the MODE SELECTOR III conversion connector.

3. Handling

1) Use the M mode selector buttons only.
2) During mode selection, "BLANK" lights up when no mode is being selected.
3) If the right M mode selector button is kept pressed, EJECT, USE, GL, Q.REW, GL, REC and READY light up in that order.
4) When changing over from the READY mode back to the EJECT mode, press the left M mode selector button to select your desired mode.


SONY
MODESELECTOR III
STOP FWT EJECT ULD FWD
EJECT GL Q.REW USE READY REC BLANK
EJECT READY REC GUIDE LOAD USE (STOP) BLANK
M-SW
For U Mechanism
For FL (Q) Mechanism
For O and O' Mechanisms
NORMAL
SLOW
OFF
M-SW
UNLOAD.
LOAD.

Ref. No. J-13 MODE SELECTOR III Panel

Fig. 4

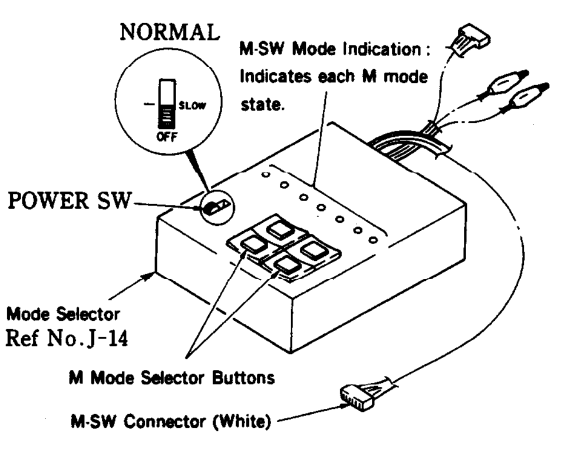

NORMAL
M-SW Mode Indication : Indicates each M mode state.
SLOW
OFF
POWER SW
Mode Selector
Ref No.J-14
M Mode Selector Buttons
M-SW Connector (White)

Fig. 5

For CCD-V11/V88

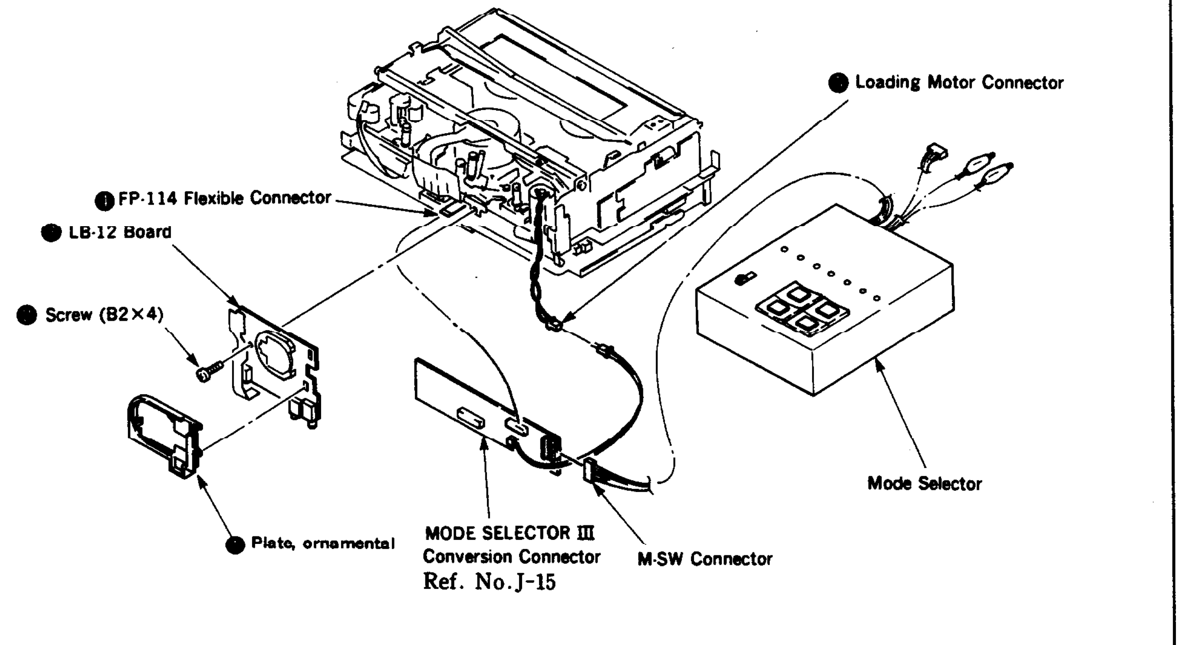
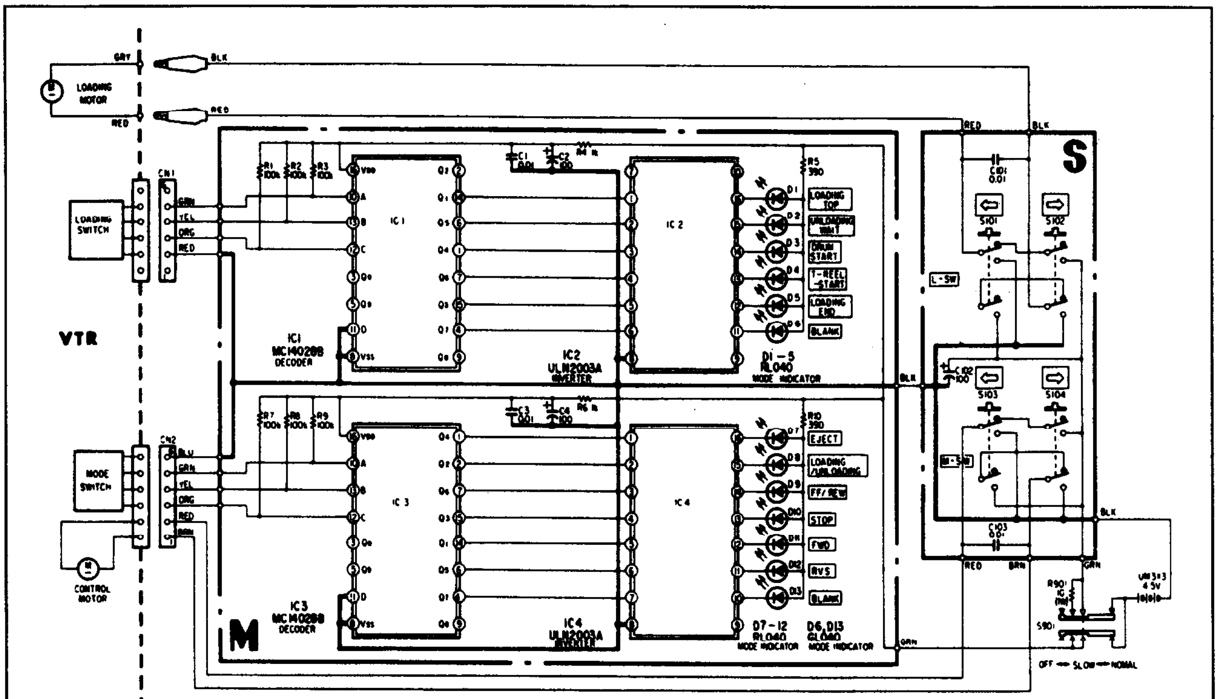

● Loading Motor Connector
● FP-114 Flexible Connector
● LB-12 Board
● Screw (B2×4)
● Plate, ornamental
MODE SELECTOR III Conversion Connector Ref. No.J-15
M-SW Connector
Mode Selector

Fig. 6

1-5 MODE SELECTOR SCHEMATIC DIAGRAM


GRY
BLK
LOADING MOTOR
RED
CN1
LOADING SWITCH
GRN
YEL
ORG
RED
VTR
CN2
BLU
MODE SWITCH
CONTROL MOTOR
BRN
R1 100k
R2 100k
R3 100k
C1 0.01
C2 100
R4 1k
R5 390
IC1 MC14028B DECODER
IC2 ULN2003A INVERTER
IC 1
IC 2
VDD
VSS
D1
D2
D3
D4
D5
D6
LOADING TOP
UNLOADING WAIT
DRUM START
T-REEL -START
LOADING END
BLANK
D1-5 RL040 MODE INDICATOR
R7 100k
R8 100k
R9 100k
C3 0.01
C4 100
R6 1k
R10 390
IC 3
IC 4
D7
D8
D9
D10
D11
D12
D13
EJECT
LOADING /UNLOADING
FF/REW
STOP
FWD
RVS
BLANK
IC3 MC14028B DECODER
IC4 ULN2003A INVERTER
D7-12 RL040 MODE INDICATOR
D6, D13 GL040 MODE INDICATOR
M
S
RED
BLK
C101 0.01
S101
S102
L-SW
C102 100
S103
S104
M-SW
C103 0.01
BLK
RED
BRN
GRN
R901 1Ω (1W)
UM3×3 4.5V
S901
OFF ← SLOW → NOMAL

M-SW (IC 3)

DECODER INPUT			MODE	LED NO
C	B	A		
0	0	0		
0	0	1	FWD	D11
0	1	0	LOADING/UNLOADING	D8
0	1	1	STOP	D10
1	0	0	EJECT	D7
1	0	1	RVS	D12
1	1	0	FF/REW	D9
1	1	1	BLANK	D6

0: INPUT LEVEL L
1: INPUT LEVEL H

L-SW (IC 1)

DECODER INPUT			MODE	LED NO.
C	B	A		
0	0	0		
0	0	1	LOADING TOP	D1
0	1	0		
0	1	1	LOADING END	D5
1	0	0	DRUM START	D3
1	0	1	UNLOADING WAIT	D2
1	1	0	T-REEL -START	D4
1	1	1	BLANK	D6

SWITCH		DIRECTION OF MOTOR REVOLUTION
⇦	⇨	
OFF	OFF	STOP
ON	OFF	⇦
OFF	ON	⇨

⇦ L-SW LOADING END → LOADING TOP
M-SW RVS → EJECT

⇨ L-SW LOADING TOP → LOADING END
M-SW EJECT → RVS

1-6 MODE SELECTOR PARTS LIST

Ref. No	Part No.	Description		
		CAPACITOR		
C1	1-108-579-00	MILER	0.01μF	50V
C2	1-123-333-00	ELECT	100μF	24V
C3	1-108-579-00	MILER	0.01μF	50V
C4	1-123-333-00	ELECT	100μF	24V
C101	1-108-579-00	MILER	0.01μF	50V
C102	1-123-333-00	ELECT	100μF	24V
C103	1-108-579-00	MILER	0.01μF	50V
		DIODE		
D1	8-719-812-31	DIODE TLR123		
D2	8-719-812-31	DIODE TLR123		
D3	8-719-812-31	DIODE TLR123		
D4	8-719-812-31	DIODE TLR123		
D5	8-719-812-31	DIODE TLR123		
D6	8-719-812-33	DIODE TLG123A		
D7	8-719-812-31	DIODE TLR123		
D8	8-719-812-31	DIODE TLR123		
D9	8-719-812-31	DIODE TLR123		
D10	8-719-812-31	DIODE TLR123		
D11	8-719-812-31	DIODE TLR123		
D12	8-719-812-31	DIODE TLR123		
D13	8-719-812-33	DIODE TLG123A		

Ref. No	Part No.	Description		
		IC		
IC1	8-752-240-28	IC TC4028BP		
IC2	8-752-120-03	IC μPA2003C		
IC3	8-759-240-28	IC TC4028BP		
IC4	8-759-120-03	IC μPA2003C		
		RESISTOR		
R1	1-247-179-00	CARBON	100K	1/4W
R2	1-247-179-00	CARBON	100K	1/4W
R3	1-247-179-00	CARBON	100K	1/4W
R4	1-247-131-00	CARBON	1K	1/4W
R5	1-247-121-00	CARBON	390	1/4W
R6	1-247-131-00	CARBON	1K	1/4W
R7	1-247-179-00	CARBON	100K	1/4W
R8	1-247-179-00	CARBON	100K	1/4W
R9	1-247-179-00	CARBON	100K	1/4W
R10	1-247-121-00	CARBON	390	1/4W
R901	1-214-594-00	METAL	10	1W

2. PERIODIC CHECK AND MAINTENANCE

- Carry out the following maintenance and periodic checks in order not only to fully exhibit the functions and performance of the set, but also for the equipment and tape. After repairing, service the set as follows, regarless of the length of use.

2-1 CLEANING OF ROTARY DRUM ASSEMBLY

1) Gently apply chamois cloth (Ref. No. J-2) soaked in cleaning liquid (Ref. No. J-1) to the rotary drum assembly.
   Clean it by rotating the upper rotary drum assembly slowly counterclockwise by hand.

Note : Do not rotate the motor by power or rotate the upper rotary drum assembly clockwise by hand. Also, the head tip is highly likely to be damaged if the chamois cloth is moved in a pependicular direction to the it. Make sure to follow the instructions above for cleaning the rotary drum assembly.

2-2 CLEANING OF TAPE PATH (Fig. 7)

1) In the EJECT mode, clean the tape running system (TG-1, -2, -3, -4, -5, -6, -7, -8, -9, -10, -11, pinch roller, and capstan shaft) and the lower drum, using a superfine applicator (Ref. No. J-3) soaked in the cleaning liquid.

Note : Note that no oil or grease of each link mechanism adheres to the superfine applicator (Ref. No. J-3).

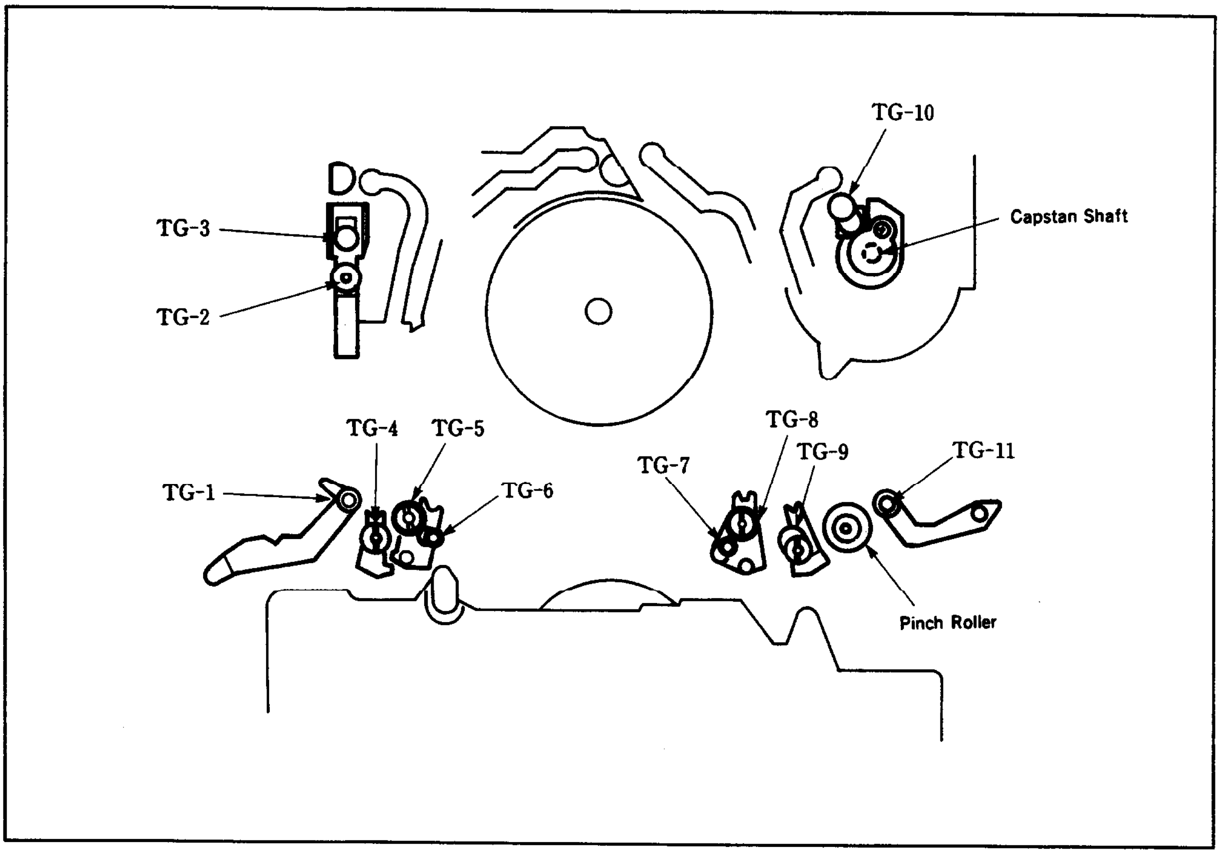


Fig. 7

2-3 PERIODIC CHECK ITEMS

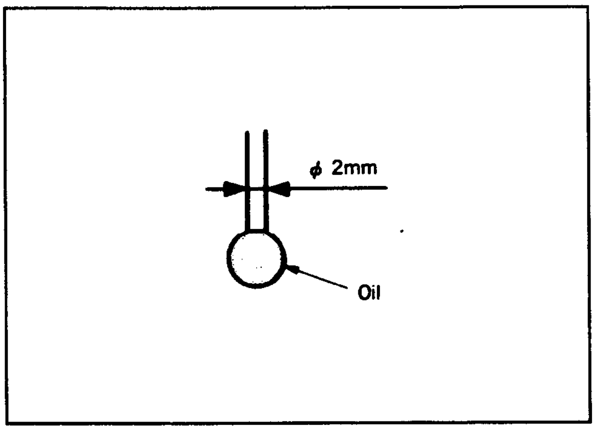
Location of Maintenance and check		Hours of Use (H)										Remarks
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	
Tape trans-portion System	Cleaning of tape path surface	○	○	○	○	○	○	○	○	○	○	Be careful of oil
	Cleaning and degaussing of rotary assembly	○	○	○	○	○	○	○	○	○	○	Be careful of oil
Driving System	Relay belt	—	☆	—	☆	—	☆	—	☆	—	☆	3-728-212-01
	Capstan shaft	—	◎	—	◎	—	◎	—	◎	—	◎	Be adsolutely careful not to get oil on the tape path surface.
	Relay pulley sheft	—	◎	—	◎	—	◎	—	◎	—	◎	
	Loading motor	—	☆	—	☆	—	☆	—	☆	—	☆	1-541-607-11
Performance Confirmation	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	—	☆	—	☆	—	☆	—	☆	—	☆	
	Brake system	—	☆	—	☆	—	☆	—	☆	—	☆	
	FWD. RVS torque measurement	—	☆	—	☆	—	☆	—	☆	—	☆	

○ : Cleaning ◎ : Oil ☆ : Confirmation

Note : When overhauling, refer to the items above to replace parts.

Note : Concerning oil

- Be sure to use specified oil. (If you use oil with different visicosity, etc., it may cause troubles.)
  Oil : Part No. 7-661-018-18 (Mitsubishi Diamond Oil Hydrofluid NT-68)
- When lubricating bearings, be sure use oil free from dust, etc. (If you use oil with dust, etc. contained, it may cause bearings to be worn out or seized.)
- A drip of oil refers to an amount attached to the tip of a ϕ 2mm stick shown in the right figure.

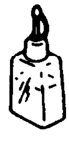


2-4 Service jigs list

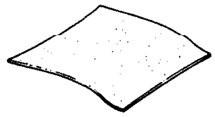
Ref. No.	Neme	Part No.	Fixture No.	Usage and Others
J-1	Cleasing fluid	Y-2031-001-0	—	
J-2	Cleasing cloth	2-034-697-00	—	
J-3	Super fine applicator (Made by NIPPON APPLICATOR, P752D)		—	
J-4	Head degausser	Widely available	—	
J-5	Small mirror for adjustment Spare mirror	J-6080-029-A J-6080-030-1	SL-5052	Tape path
J-6	Alignment tape NTSC (WR5-1N) PAL (WR5-1C)	8-967-995-01 8-967-995-06		Tape path
J-7	Dial tension gauge	J-6080-827-A		Various torque measurement
J-8	Tension measurement reel	J-6080-831-A		With ϕ30 tape
J-9	FWD and RVS winding torque cassette	J-6080-824-A	GD-2086	
J-10	Drum screwdriver (Hexagonal wrench screwdriver)	7-700-766-01		
J-11	Screwdriver for tape path	J-6082-026-A		For tape guide adjustment
J-12	Mode selector III panel	J-6082-023-A		
J-13	Mode selector	J-6080-825-A		For all models
J-14	Mode selector III conversion connector	J-6082-021-A		

Other equipment
- Oscilloscope
- Analog tester (20kΩ)

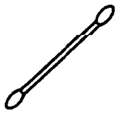
J-1



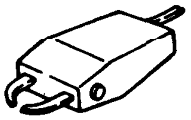
J-2



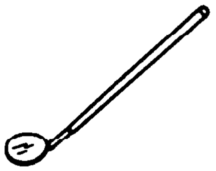
J-3



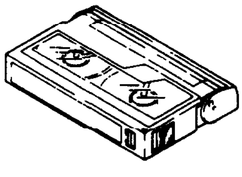
J-4



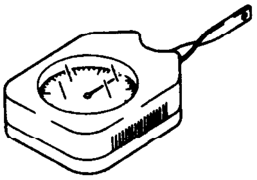
J-5



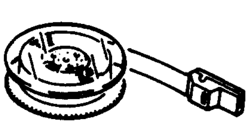
J-6



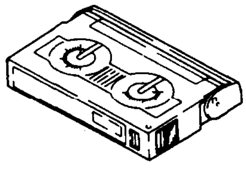
J-7



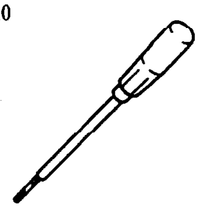
J-8



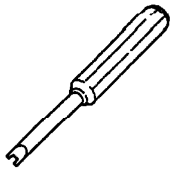
J-9



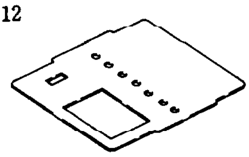
J-10



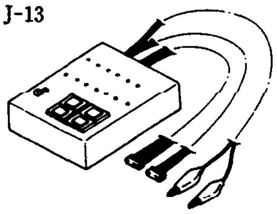
J-11



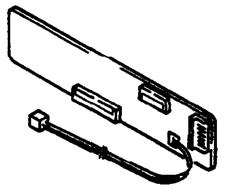
J-12



J-13



J-14



3. MECHANICAL CHECK, ADJUSTMENT AND REPLACEMENT

Note : Use the mode selector (Ref. No. J-14) for the following mechanical checks, adjustments and replacements.

Note : The modes in ☐ are those set by pressing the mode selector buttons.

3-1 LED BASE (Fig. 8)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder assembly.
3) As shown in Fig. A. rotate the LED in a direction of the arrow Ⓐ and remove it in a direction of the arrowⒷ.
4) Remove the three screws ●, ● and ●.
5) Lifting the LED base ●, remove it by pushing it in a direction of the arrowⒸ.

Note : Dismount and remount the LED base carefully, because its holder is easily deformed.

2. Mounting

1) Select the USE mode.
2) Put the claw ● of the LED base ● in the notch ● of the LS chassis without catching the LED in between. Next, fit to the dowels ● at 2 places.
3) Mount and tighten the screws ●, ● and ● in that order.
4) As shown in Fig. B, set the LED in a direction of the arrowⒶ and rotate it in a direction of the arrowⒷ to fix.
5) As shown in Fig. C, bend a flexible boord and put it in the holder.

Note : In the step2), make sure that the barring ● of the arm assy, gear can appears in the hole of the LED base. (Fig. D)

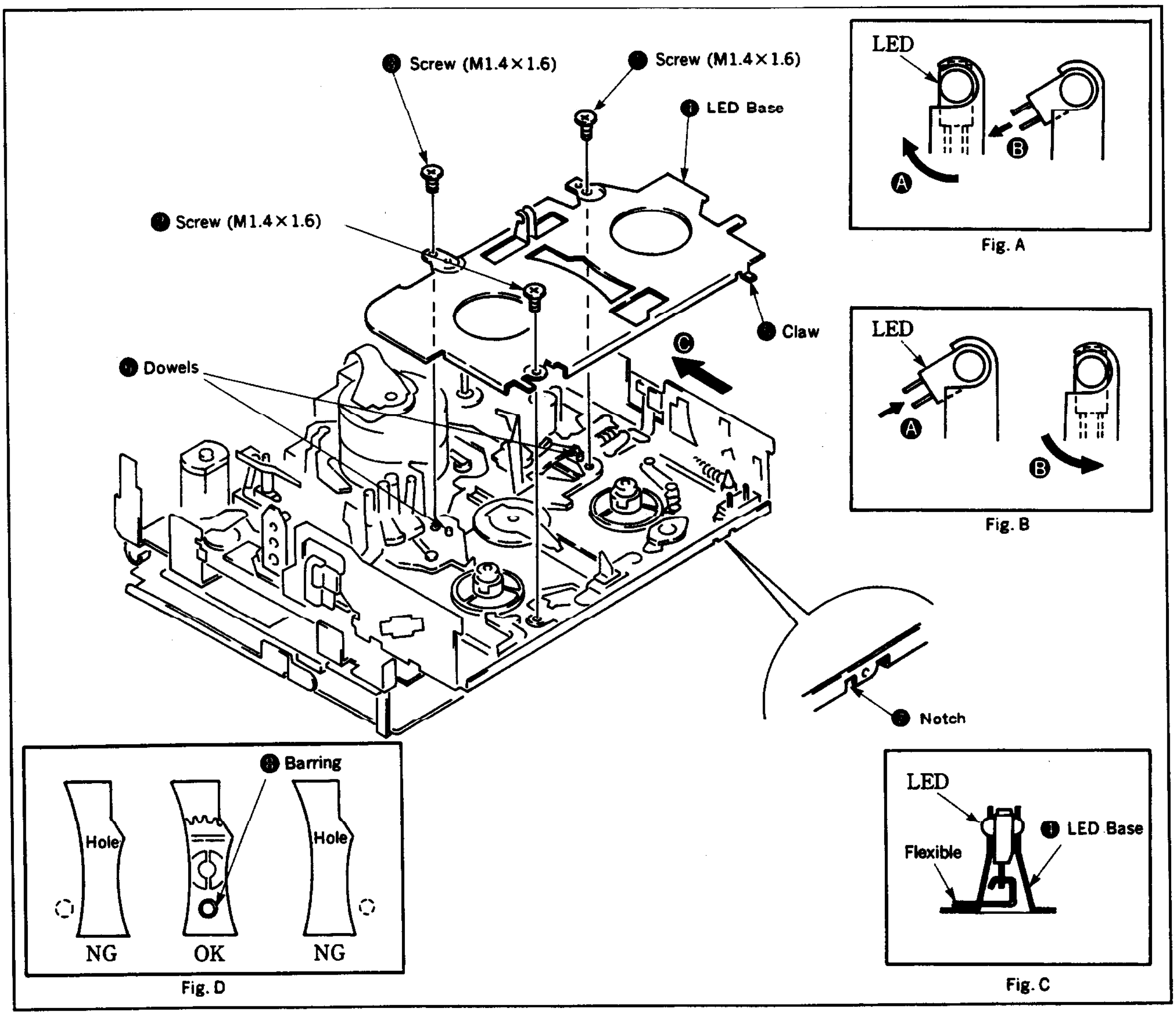


Fig. A

Fig. B

Fig. C

Fig. D

Fig. 8

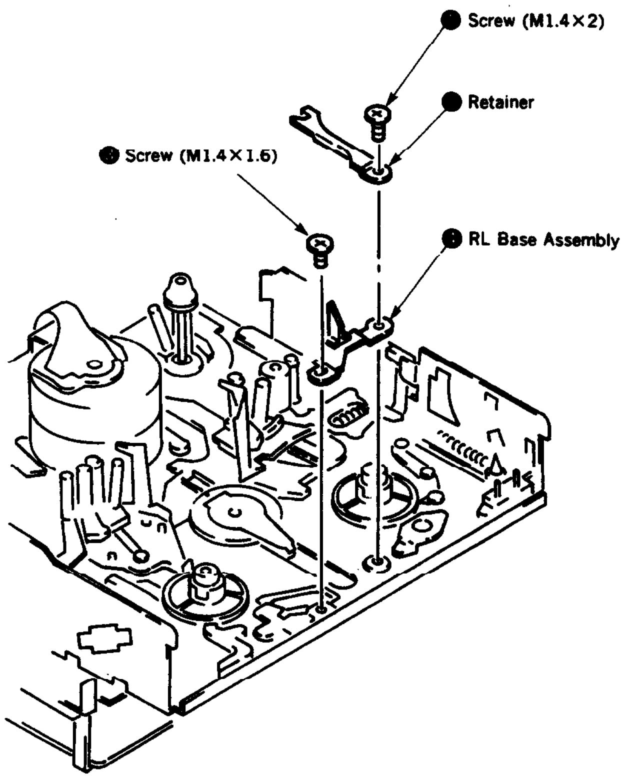
3-2 RL BASE ASSEMBLY, RETAINER (Fig. 9)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder assemlby.
3) Referring to 3-1, remove the LED base.
4) Remove the screw ●, and then, retainer ●.
5) Remove the screw ●, and then, RL base assembly ●.

2. Mounting

1) Select the USE mode.
2) With the screw ●, mount the RL base assembly ● to the LS chassis.
3) With the screw ● fix the retainer ● to the RL base assembly ●.
   When this is done, align the bump part ✱ of the retainer ● with the bump part ✱ of the guide rail T. (Fig. A)
4) Referring to 3-1, mount the LED base.
5) Referring to 1-1, mount the cassette compartment holder assembly.


● Screw (M1.4×2)
● Retainer
● Screw (M1.4×1.6)
● RL Base Assembly

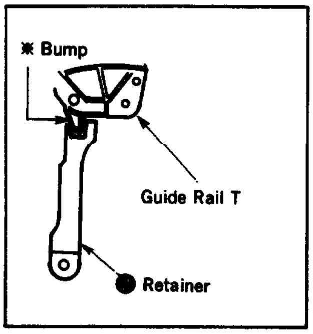

✱ Bump
Guide Rail T
● Retainer

Fig. A

Fig. 9

3-3 TABLE ASSY, REEL, SUPPLY (Fig. 10)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder assembly.
3) Referring to 3-1, remove the LED base.
4) As shown in Fig. A, making use of slackness of the tension regulator string ● in the USE mode, remove the string out of the groove of the table assy, reel, supply ●. When this is done, be careful not to bend the tension regulator string ● and the S soft arm ● must be moved in a direction of the arrow Ⓑ.
5) Remove the table assy, reel, supply ●.

Note : Dismount and remount the table assy, reel, supply ●, holding the reel claw ✱.

2. Mounting

1) Select the USE mode.
2) As shown in Fig. B, move the S soft arm ● in a direction of the arrow Ⓑ.
3) Avoiding the tension regulator string ●, mount the table assy, reel, supply ● to the shaft ●.
4) Put the tension regulator string ● in the groove of the table assy, reel, supply ● and fit it properly by turning the table assy, reel, supply ●.
5) Referring to 3-1, mount the LED base.
6) Referring to 1-1, mount the cassette compartment holder assembly.

Note : Do not touch the tension regulator string ● with naked hand. Also, be careful of adhesion of grease, etc.

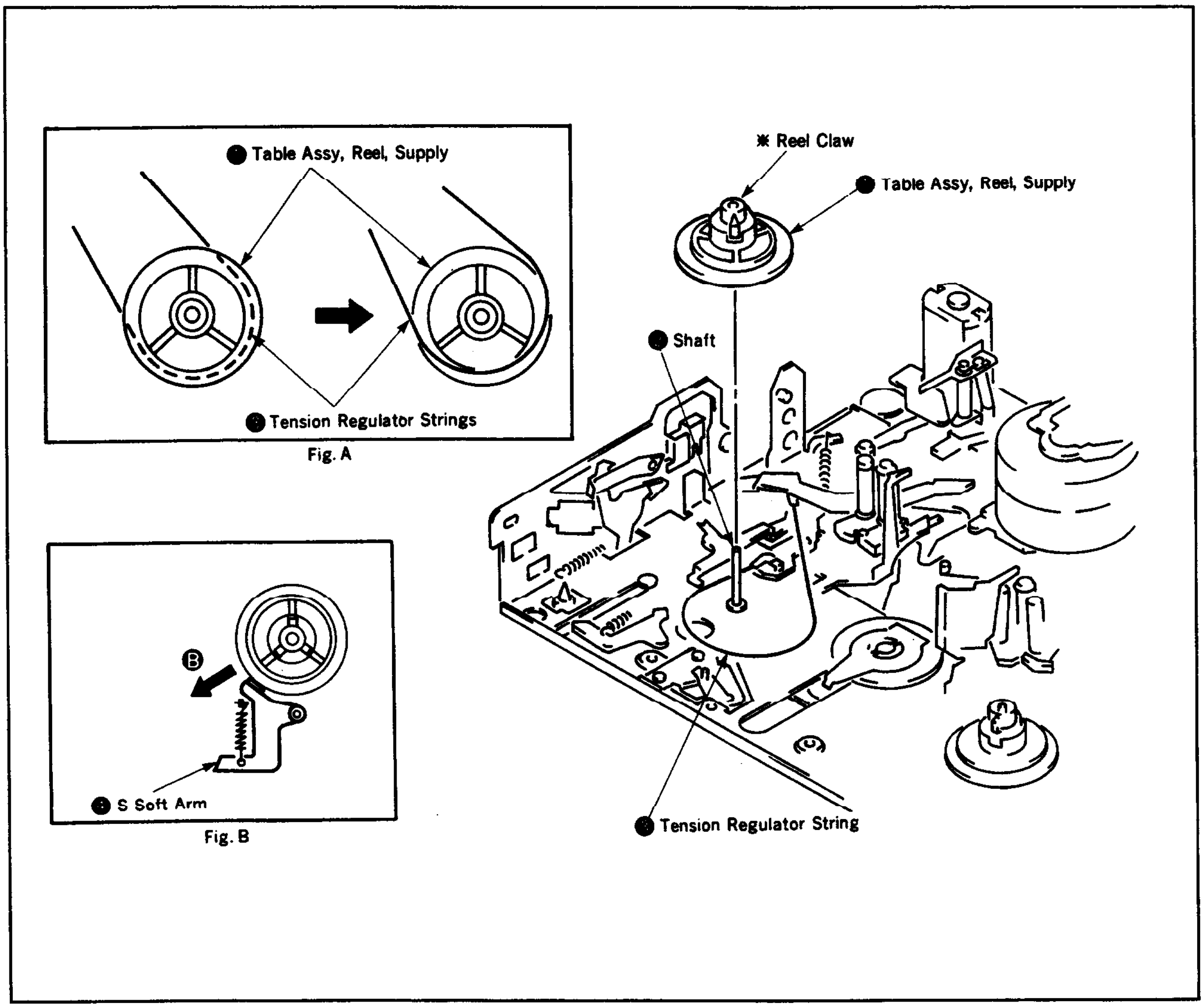

● Table Assy, Reel, Supply
● Tension Regulator Strings
Ⓑ
● S Soft Arm
✱ Reel Claw
● Table Assy, Reel, Supply
● Shaft
● Tension Regulator String

Fig. A

Fig. B

Fig. 10

3-4 TABLE ASSY, REEL, TAKE-UP (Fig. 11)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder assembly.
3) Referring to 3-1, remove the LED base.
4) Referring to 3-2, remove the retainer.
5) Dispace the T ratchet ● in a direction of the arrowⒶ.
6) With the claw (T ratchet head) of the T ratchet ● moved in a direction of the arrowⒷ, remove the Table assy, reel, take-up ●.

Note : Dismount and remount the Table assy, reel, take-up ●, holding the reel claw ✱.

2. Mounting

1) Select the USE mode.
2) With the claw (T ratchet head) of the T ratchet ● moved in an arrow direction, mount the Table assy, reel, take-up ● to the shaft ●.
3) Referring to 3-2, mount the retainer.
4) Referring to 3-1, mount the LED base.
5) Referring to 1-1, mount the cassette compartment holder assembly.

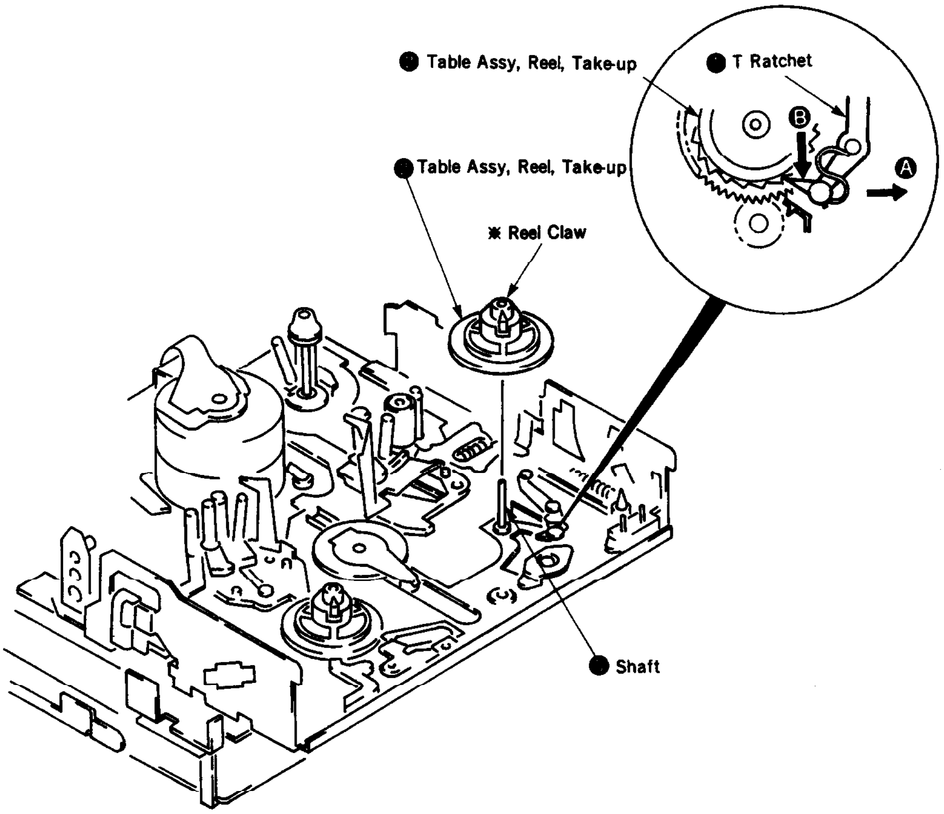


Fig. 11

3-5 ONEWAY CLUTCH ASSEMBLY (Fig. 12)

1. Removal

1) Select the USE mode.
2) Referring to the cassette compartment holder assembly.
3) Referring to 3-1, remove the LED base.
4) Remove the screw ❶, and then, oneway clutch assembly ❷.

2. Mounting

1) Select the USE mode.
2) Mount the oneway clutch assembly ❷ to the LS chassis and fix with the screw ❶.
3) Referring 3-1, mount the LED base.
4) Referring to 1-1, mount the cassette compartment holder assembly.

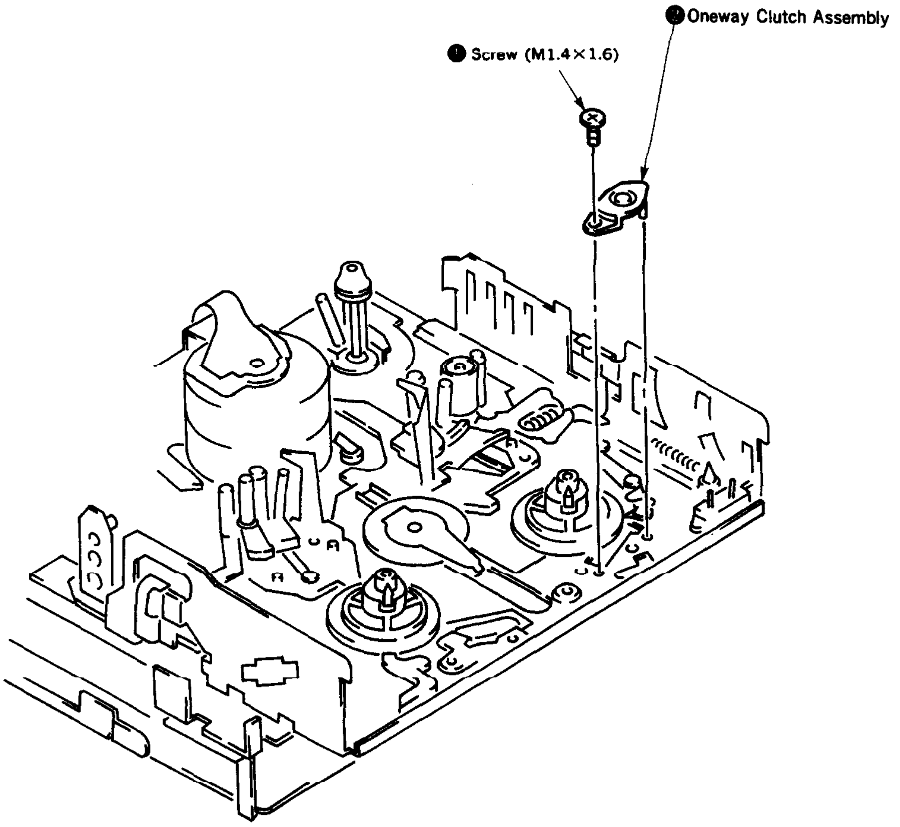


Fig. 12

3-6 S SOFT ARM ASSEMBLY (Fig. 13)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder assembly.
3) Referring to 3-1, remove the LED base.
4) Rerove the lock washer ❶, and then, the spring, tension ❷.
5) Remove the S soft arm assembly ❸ by rotating it in an arrow direction (until the hook ❺ comes off the LS chassis).

2. Removal

1) Select the USE mode.
2 As shoms in Fig. A, apply a quarter drip of oil to the arrowir dicated part of the shaft ❹.
3) Mount the S soft arm assembly ❸ to the shaft ❹, rotating it ii as arrow direction. (Be careful not to bend the hook ❺.)
4) Hook the spring, tension 2 onto the claw and fix it with locl washer 1.
5) Referring to 3-1, mount the LED base.
6) Referring to 1-1, mount the cassette compartment holdei assembly.

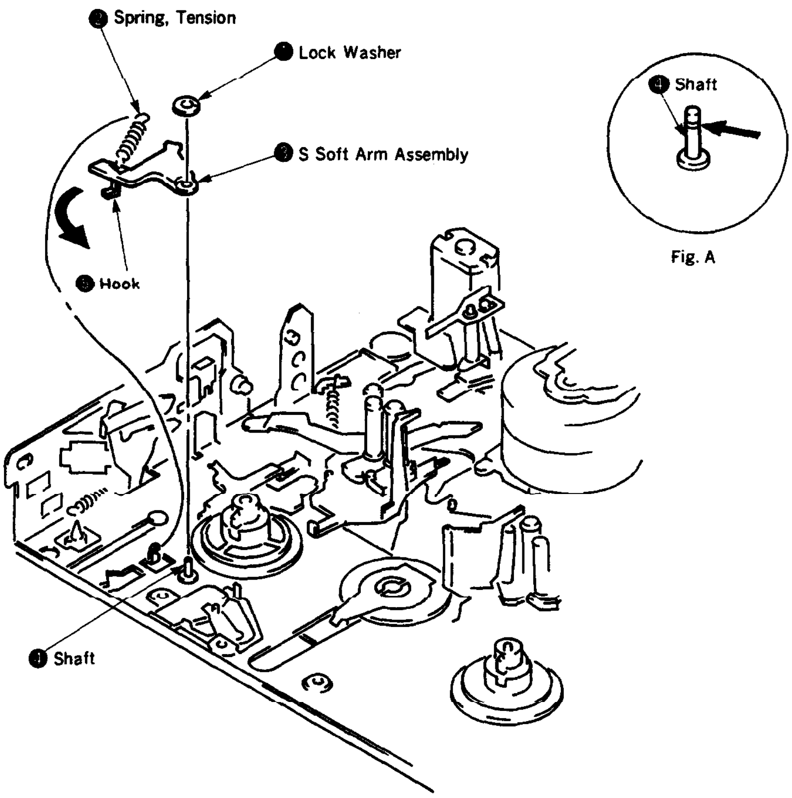


Fig. 13

3-7 LS CHASSIS ASSEMBLY (Fig. 14)

1. Removal

1) Select the USE mode.
2) Referring to 1-1, remove the cassette compartment holder.
3) Referring to 3-1, remove the LED base.
4) Referring to 3-2, remove the RL base assembly and retainer.
5) Remove the lock washer ❶, and then, arm assy gear ❷.
6) Select the Q, REW mode.
7) Remove the flexible rotary shaft ❸, and then, the flexible connector ❹.
8) Remove the E retaining ring ❺ and three screws ❻.
9) Remove the LS chassis assembly ❼ in a direction of the arrow Ⓓ.

2. Mounting

1) As shown in Fig. A, apply Molyton grease to the arrow-indicated part of the LS chassis assembly ❼.
2) Unload in the RDY mode. Start docking in the Q, REW mode after first GL. When docking the mechanical chassis and LS chassis assembly ❼, it is necessary to place the following parts at specified positions.
3) Put the pin ㉔of the pinch arm assembly ㉓into the left side of the pinch press arm assembly㉕. (Fig.19)
4) Move the TG-1 arm assembly⓯in a direction of the arrow Ⓐ to put the pin ⓰into the concave of the arm assembly ⓱. (Fig. 17)
5) put the pin⓳of the S ratchet⓲into the right side the of the arm assembly⓱. (Fig. 17)

Simultaneously performing the operations above, push the roller of the guide lock arm ❽ With the arm arc portion of the guide arm T assembly⓭ (Fig. 15) to push the LS chassis assembly ❼ in a direction of the arrow Ⓔ, and at the same time, engage the claws of the guide rail base 1❿, guide rail base 2⓫and guide rail base3⓬with those of the guide rail S㉕ and guide rail T㉖. (Fig. 16)

Then, align the shafts ❾ of the mechanical chassis With the four long joints of the LS chassis assembly ❼, and put the LS pin㉑of the LS arm assembly⓴in the groove of the LS cam plate㉒. (Fig.18)

Note : Before docking, confirm that both EJ arm and LS arm are deeply inserted into the shafts. (If not properly fit, the set does not function even if the LS chassis is docked.

6) Mount the E retaining ring ❺ and three screws ❻.
7) Mount the flexible rotary shaft ❸ and flexible connector ❹.
8) Select the USE mode.
9) Mount the arm assy gear ❷ and fix with the lock washer ❶.
10) Referring to 3-2, mount the RL base assembly and retainer.
11) Referring to 3-1, mount the LED base.
12) Referring to 1-1, mount the cassette compartment holder assembly.

Note : Using the mode selector, confirm that loading and unloading are performed smoothly.

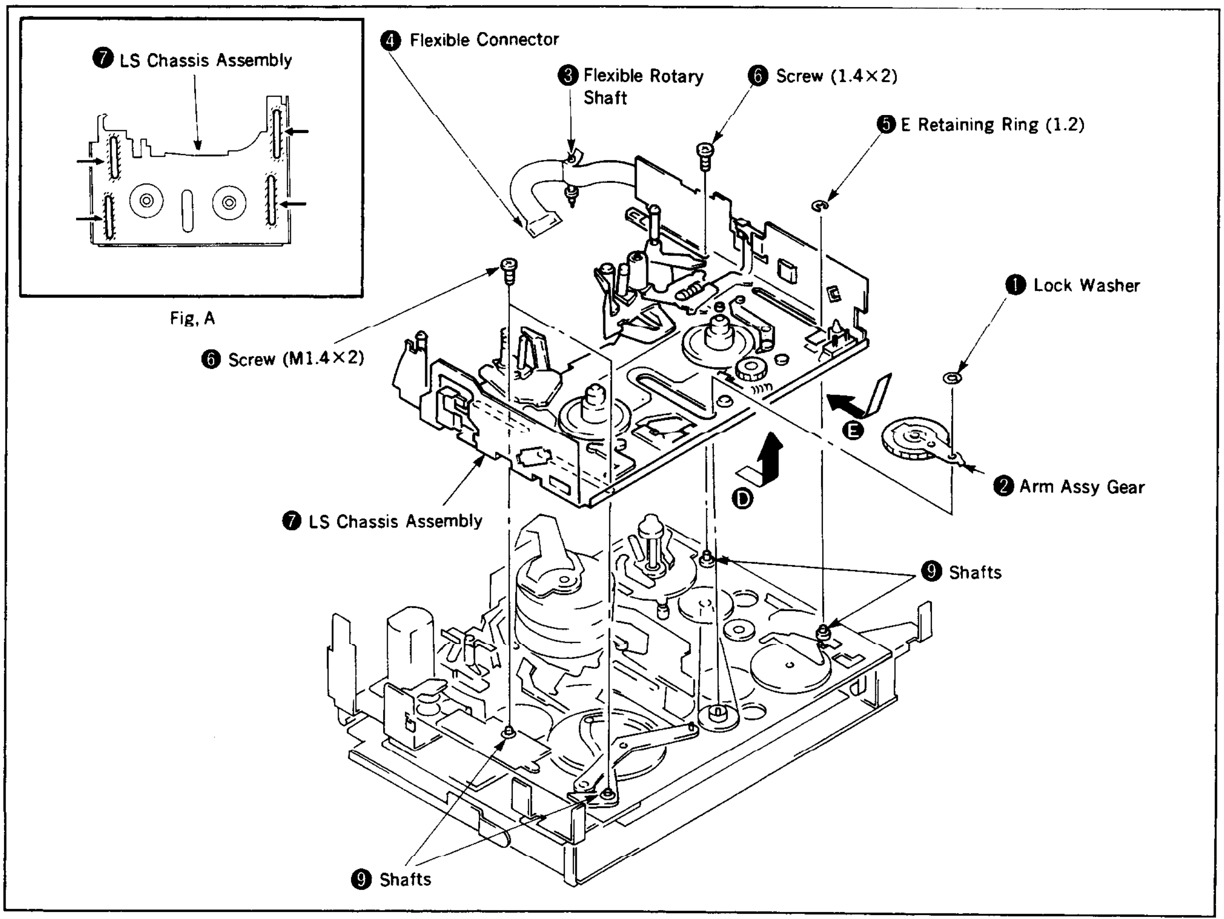


Fig. 14

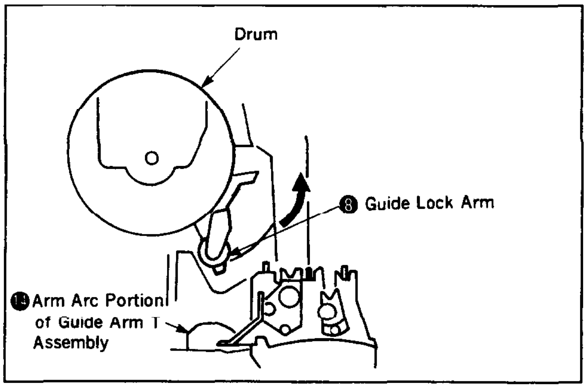

Drum
⑧ Guide Lock Arm
⑭ Arm Arc Portion of Guide Arm T Assembly

Fig. 15

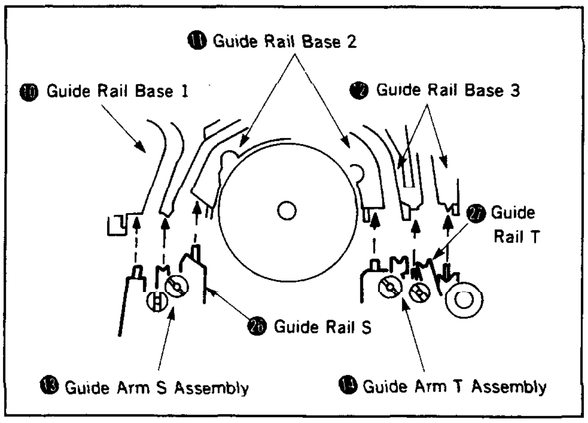

⑪ Guide Rail Base 2
⑩ Guide Rail Base 1
⑫ Guide Rail Base 3
㉗ Guide Rail T
㉖ Guide Rail S
⑬ Guide Arm S Assembly
⑭ Guide Arm T Assembly

Fig. 16

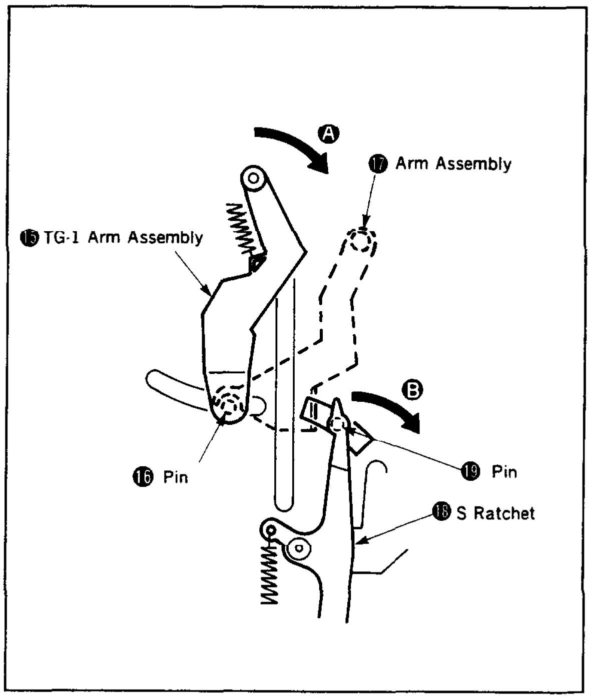

Ⓐ
⑰ Arm Assembly
⑮ TG-1 Arm Assembly
Ⓑ
⑯ Pin
⑲ Pin
⑱ S Ratchet

Fig. 17

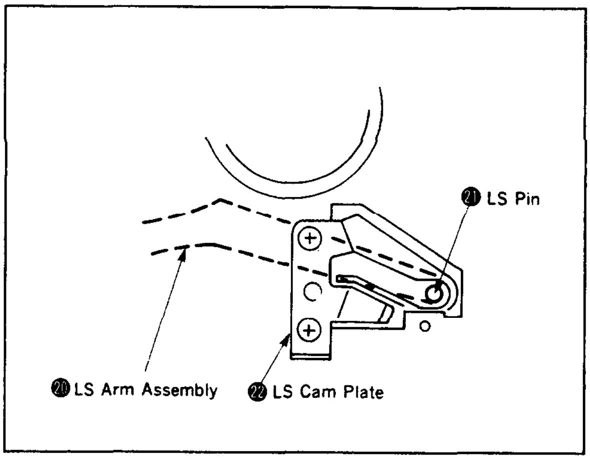

㉑ LS Pin
⑳ LS Arm Assembly
㉒ LS Cam Plate

Fig. 18

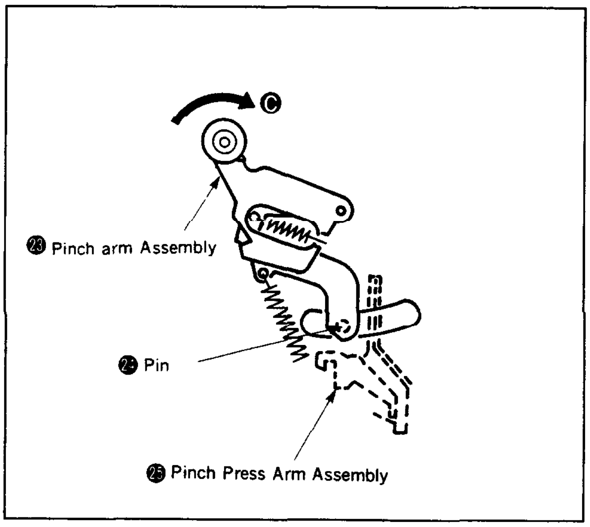

Ⓒ
㉓ Pinch arm Assembly
㉔ Pin
㉕ Pinch Press Arm Assembly

Fig. 19

3-8 PINCH ARM ASSEMBLY (Fig. 20)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis assembly.
3) Remove the lock washer ② from the back of the LS chassis assembly ①.
4) Remove the spring, tension ③, and then, pinch arm assembly ④.

2. Mounting

1) As shown in Fig. A, apply oil to the hole of the boss ⑤ over one third of a drip up to half a drip.
2) put the rotation center of the pinch arm assembly in the boss ⑤ hole, and the pin ⑥ in the long hole.
3) Hook the spring, tension ③ onto the upper groove of the pinch return spring shaft ⑦.
4) Mount the lock washer ② from the back of the LS chassis assembly ①.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 1-1, mount the cassette compartment holder assembly.

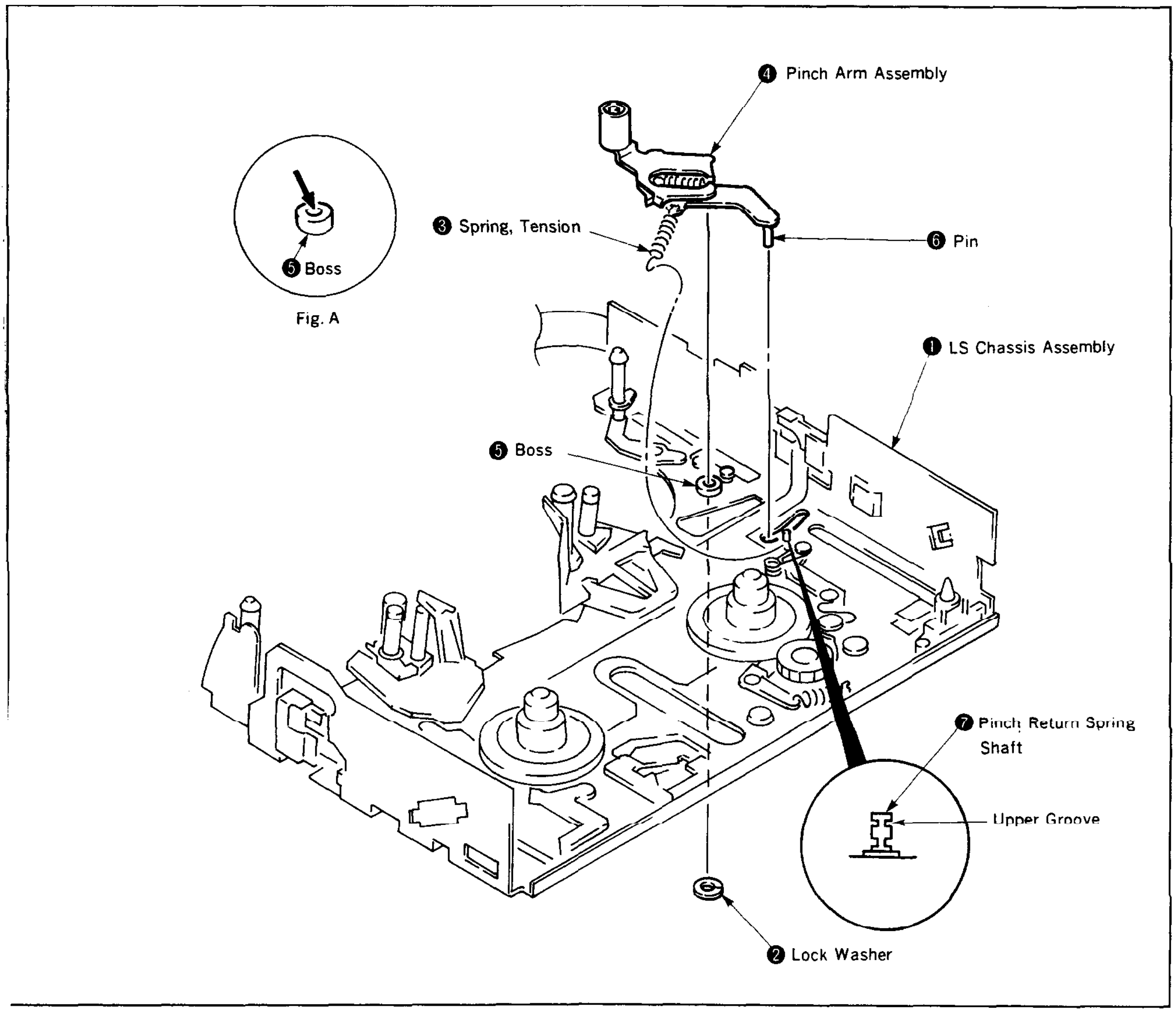

④ Pinch Arm Assembly
⑤ Boss
Fig. A
③ Spring, Tension
⑥ Pin
① LS Chassis Assembly
⑤ Boss
⑦ Pinch Return Spring Shaft
Upper Groove
② Lock Washer

Fig. 20

3-9 TG-11 ARM ASSEMBLY (Fig. 21)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis assembly.
3) Remove the lock washer ❷ from the back of the LS chassis assembly ❶.
4) Remove the TG-11 arm assembly ❸ and spring, torsion ❹.

Note : Be careful not to deform the TG-11 arm.

2. Mounting

1) As shown in Fig. A, apply oil to a boss hole over one third of a drip up a half a drip.
2) As shown in Fig. B, put the longer arm of the spring, torsion ❹ between the pinch arm boss ❺ and cam slider shaft ❽ of the LS chassis. Next, Hook the shorter arm of the spring, torsion ❹ around the pin ❻ of the TG-11 arm assembly ❸, rotate the TG-11 arm assembly and fix with the lock washer ❷. When this is done, see to it that the pin ❻ of the TG-11 arm assembly ❸ is located to the left side of the cam slider ❾ as shown in Fig. C.
3) Referring to 3-7, mount the LS chassis.
4) Referring to 1-1, mount the cassette compartment holder.

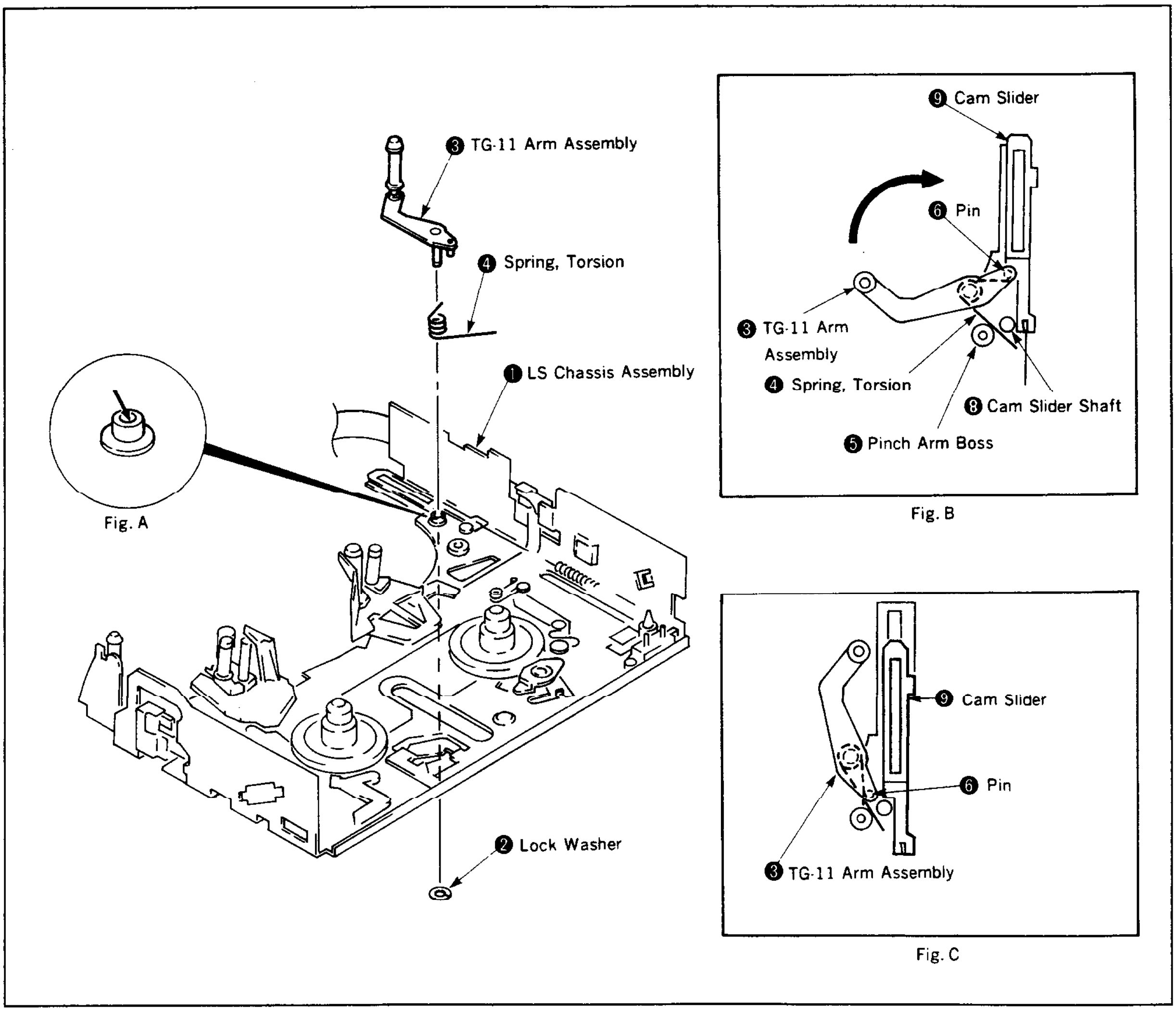

❸ TG-11 Arm Assembly
❹ Spring, Torsion
❶ LS Chassis Assembly
❷ Lock Washer
Fig. A
❾ Cam Slider
❻ Pin
❸ TG-11 Arm Assembly
❹ Spring, Torsion
❽ Cam Slider Shaft
❺ Pinch Arm Boss
Fig. B
❾ Cam Slider
❻ Pin
❸ TG-11 Arm Assembly
Fig. C

Fig. 21

3-10 TG-1 ARM ASSEMBLY (Fig. 22)

1. *Removal*

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis.
3) Referring to 3-3, remove the table assy, reel, supply.
4) Remove the lock washer ❷ from the back of the LS chassis assembly ❶.
5) Remove the spring, tension ❸. Remove the string joint ❹ from the dowel ❺ of the TG-1 adjustment block ❾ by rotating it in a direction of the arrow Ⓐ as shown in Fig. C.
6) Remove the TG-1 arm assembly ❻.

Note : Dismount and remount the string joint ❹ carefully not to deform it.

2. *Mounting*

1) As shown in Fig. A, apply oil to the hole of the boss ❼ over one third of a drip up to half a drip.
2) As shown in Fig. C, mount the string joint ❹ to the TG-1 adjustment block ❾ in the opposite direction of the arrow Ⓐ.
3) Mount the TG-1 arm assembly ❻ to the boss ❼ in such a manner not to touch the guide and insert the pin ❽ into the long hole.
4) Hook the spring, tension ❸ onto the position shown in Fig. B.
5) Mount the lock washer ❷ from the back of the LS chassis assembly ❶.
6) Referring to 3-3, mount the table assy, reel, supply.
7) Referring to 3-7, mount the LS chassis assembly.
8) Referring to 1-1, mount the cassette compartment holder assembly.

Note : Referring to 3-27, adjust a tension regulator position.

Note : Referring to 3-28. adjust a FWD back tension.

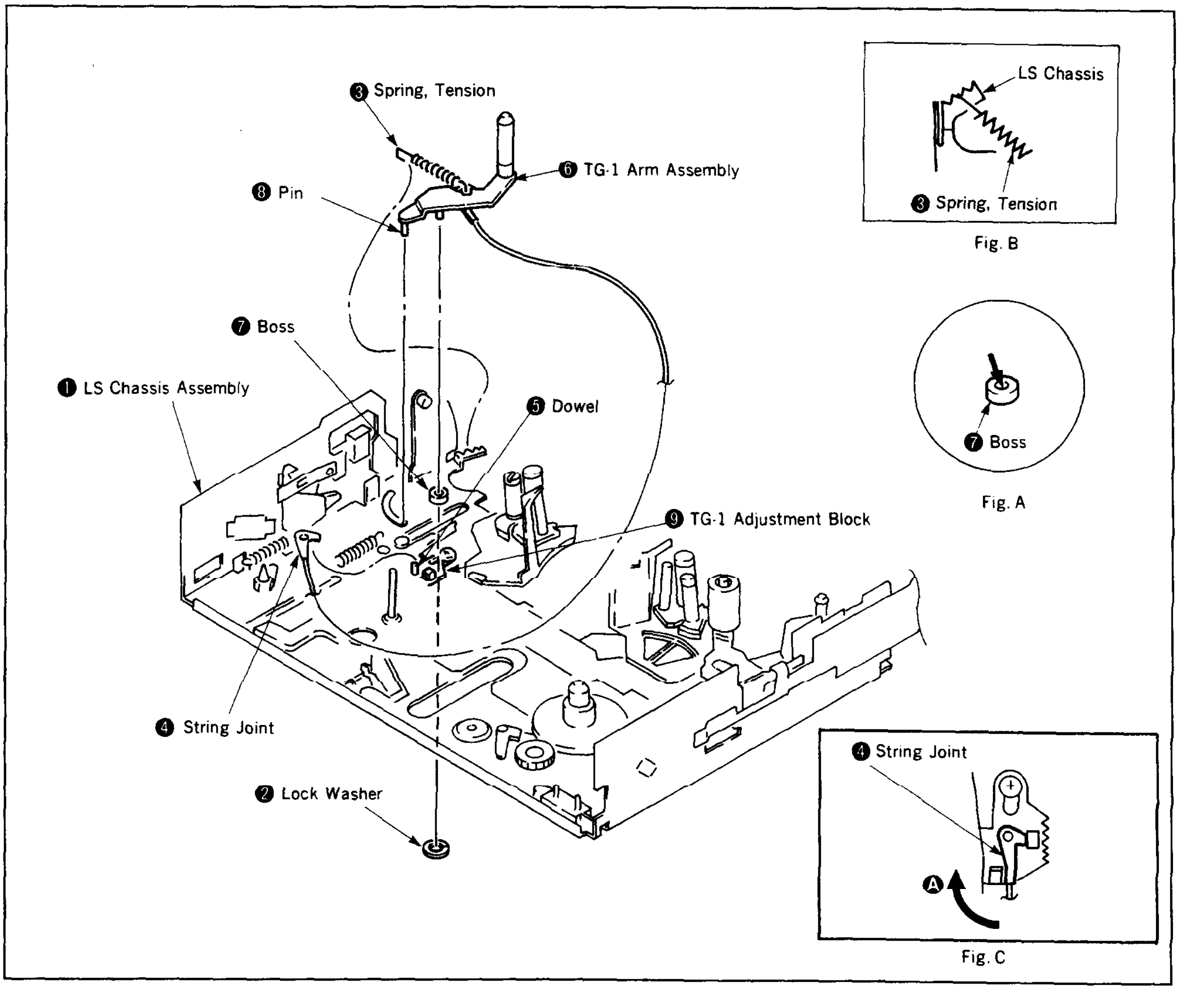

❸ Spring, Tension
❻ TG-1 Arm Assembly
❽ Pin
❼ Boss
❶ LS Chassis Assembly
❺ Dowel
❾ TG-1 Adjustment Block
❹ String Joint
❷ Lock Washer
LS Chassis
❸ Spring, Tension
❼ Boss
❹ String Joint
Ⓐ

Fig. B

Fig. A

Fig. C

Fig. 22

3-11 STRING JOINT (Fig. 23)

1. Removal

1) Referring to 3-10, remove the TG-1 arm assembly ❶.
2) Remove the joint holder ❷, and then, string assembly ❸.

2. Mounting

1) Put the dowel ❹ of the TG-1 arm assembly ❶ into the hole of the string assembly ❸ and mount the joint holder ❷. (Apply screw lock between the joint holder and TG-1 arm assembly.)
2) Referring to 3-10, mount the TG-1 arm assembly ❶.

Note : Be careful not to bend the string assembly ❸.

Note : Do not touch the guide ✻.

Note : The joint holder ❷, which was removed once, must not be used again.

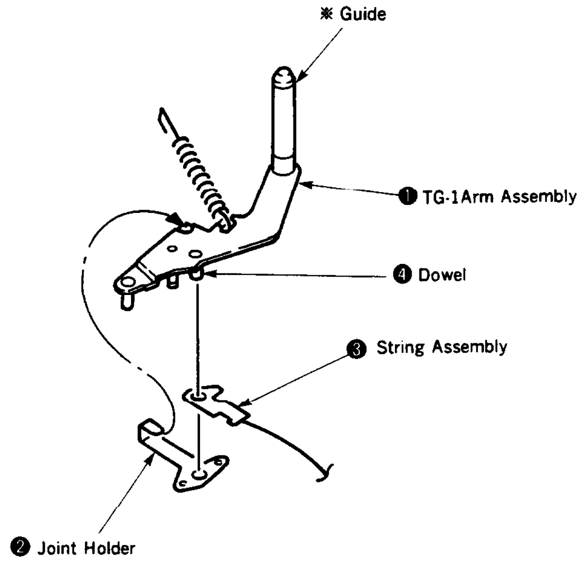

✻ Guide
❶ TG-1Arm Assembly
❹ Dowel
❸ String Assembly
❷ Joint Holder

Fig. 23

3-12 GUIDE ARM T ASSEMBLY, GUIDE ARM S ASSEMBLY

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis assembly.
3) Rotate the guide arm T assembly ❶ and guide arm S assembly in arrow directions respectively, align their shafts ❸ with the holes as shown in Fig. A, and remove them. (Fig. 24)

Note : Do not touch the guide ※. (Fig. 25 and Fig. 26)

2. Mounting

1) After inserting the guide arn T and S assemblies in the reverse order of removal, rotate them in the opposite directions of the arrows respectively.
2) Fit the TG-7 base assembly ❺ and TG-9 base assembly ❻ in the grooves of the guide rail T ❹. (Fig. 25)
3) Put the shaft ● flange in the long groove of the guide rail S ❽, and fit the TG-4 base assembly ❾ and TG-6 base assembly ❿ into the right and left grooves of the guide rail S ❽ respectively.

   When this is done, see to it that the flat spring of the TG-6 base assembly❿ is located below the guide rail S ❽ as shown in Fig. B. (Fig.26)
4) Referring to 3-7, mount the LS chassis assembly.
5) Referring to 1-1, mount the cassette compartment holder assembly.

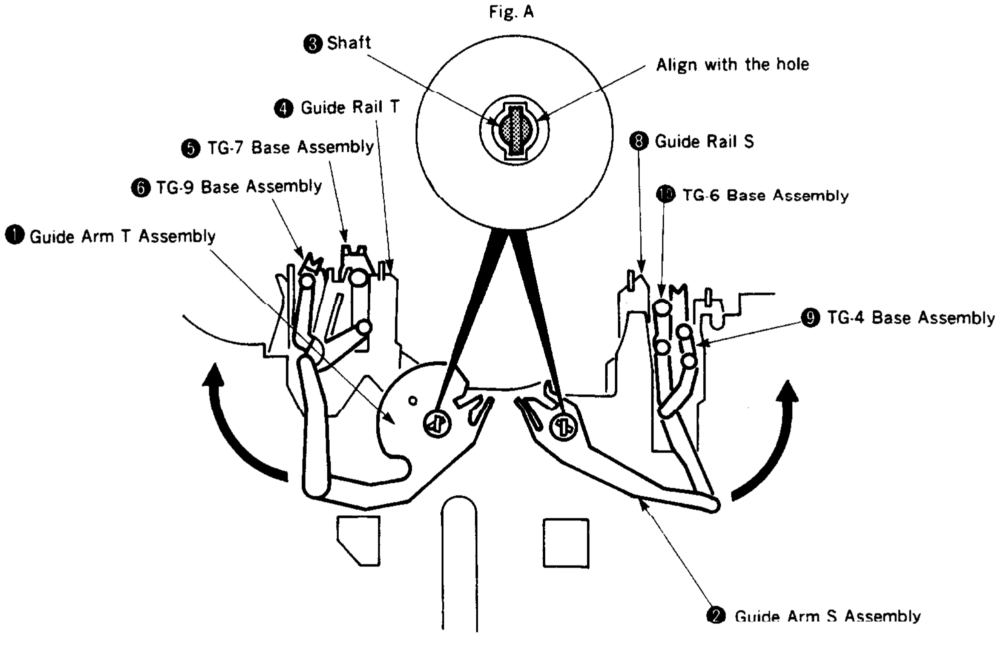


Fig. A
❸ Shaft
Align with the hole
❹ Guide Rail T
❺ TG-7 Base Assembly
❻ TG-9 Base Assembly
❶ Guide Arm T Assembly
❽ Guide Rail S
❿ TG-6 Base Assembly
❾ TG-4 Base Assembly
❷ Guide Arm S Assembly

LS Chassis Assembly Viewed from Back

Fig. 24

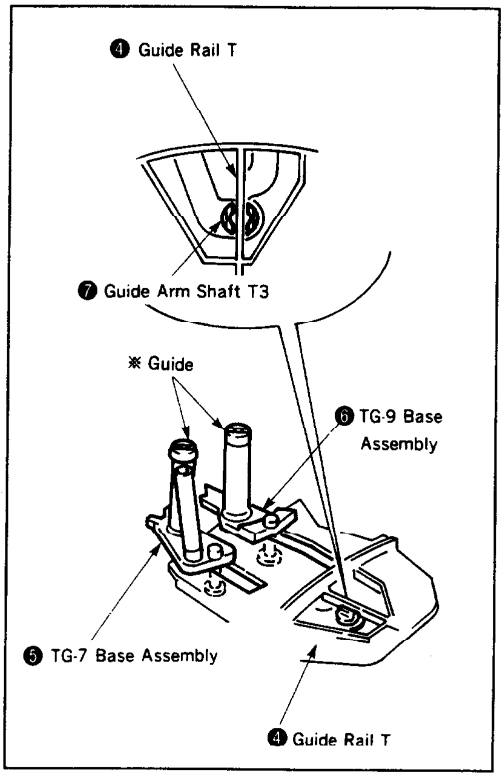

❹ Guide Rail T
❼ Guide Arm Shaft T3
※ Guide
❻ TG-9 Base Assembly
❺ TG-7 Base Assembly
❹ Guide Rail T

Fig. 25

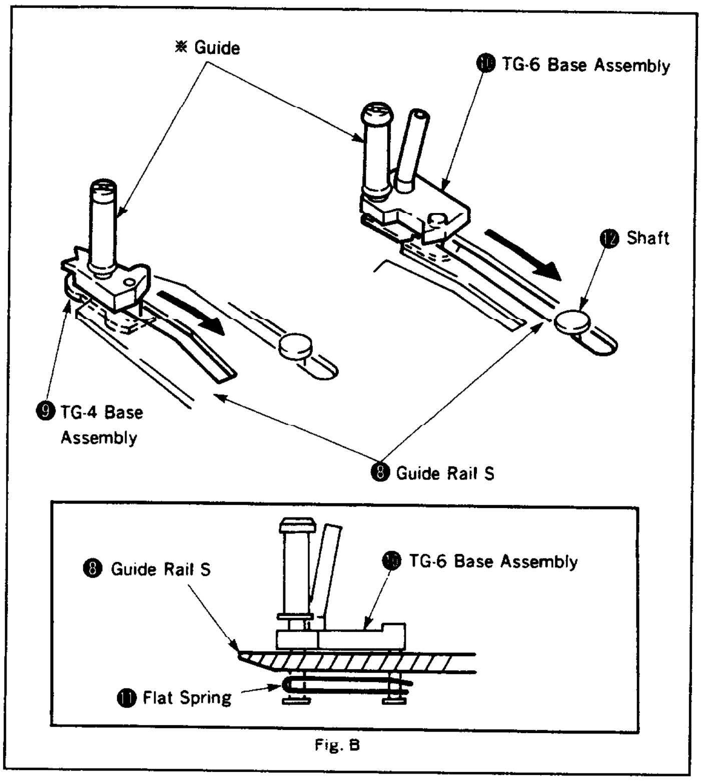

※ Guide
❿ TG-6 Base Assembly
⓬ Shaft
❾ TG-4 Base Assembly
❽ Guide Rail S
❽ Guide Rail S
❿ TG-6 Base Assembly
⓫ Flat Spring

Fig. B

Fig. 26

3-13 PINCH PRESS ARM ASSEMBLY (Fig. 27)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis.
3) Remove the screw ①, and then, pinch press arm assembly ②.

2. Mounting

1) As shown in A, apply half a drip of molyton grease to an arrowindicated part of a boss hole.
2) As shown in Fig. B, apply half a drip of molyton grease each to the pinch press arm assembly ② at 3 places.
3) Put the pin ④ of the pinch press arm assembly ② in the groove of the cam B ③.
4) Fix. with the screw ①.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 1-1, mount the cassette compartment holder assembly.

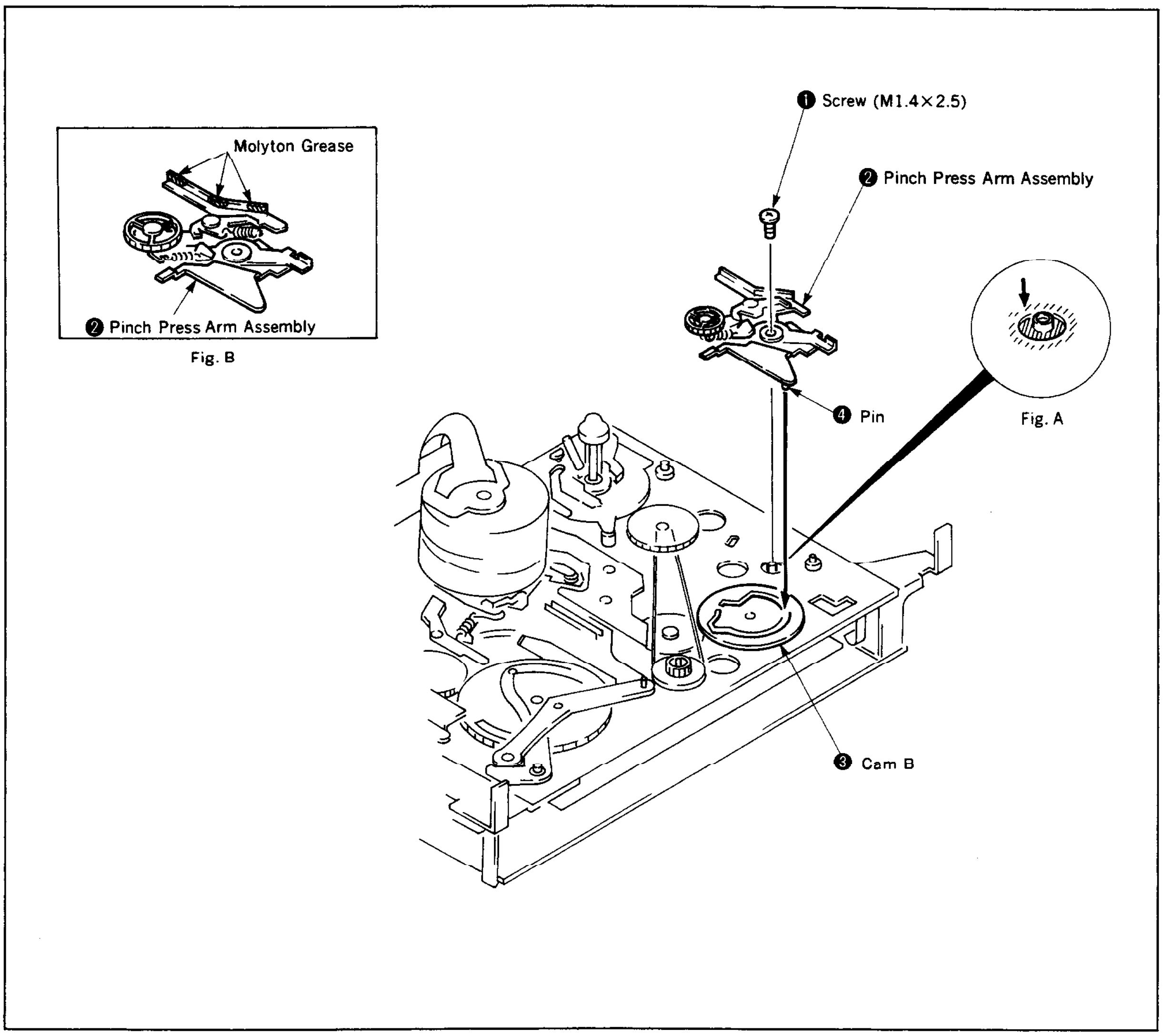

Molyton Grease
② Pinch Press Arm Assembly
Fig. B
① Screw (M1.4×2.5)
② Pinch Press Arm Assembly
④ Pin
Fig. A
③ Cam B

Fig. 27

3-14 GL SLIDER ASSEBLY (Fig. 28)

1. Removal

1) Refering to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis assembly.
3) Referring to 3-15, remove the cam A.
4) Shift the GL slider assembly ❹ in a direction of the arrowⒶ.
5) Remove the screw ❶, and then, GL support S ❷.
6) Remove the lock washer ❸, and then, GL slider assembly ❹.

2. Mounting

1) Fit the claw ❺ of the GL slider assembly ❹ in the groove of the GL support T ❼, and put the roller ❻ in the long hole of the chassis.
2) Stop with the lock washer ❸.
3) Shift the GL slider assembly ❹ in a direction of the arrowⒶ.
4) Fit the claw ❽ of the GL support ❷ in the part of the chassis marked with ※ and place the dowel ❾ in the hole of the chassis.
5) Fix with the screw ❶.
6) Referring to 3-7, mount the LS chassis assembly.
7) Referring to 1-1, mount the cassette compartment holder assembly.

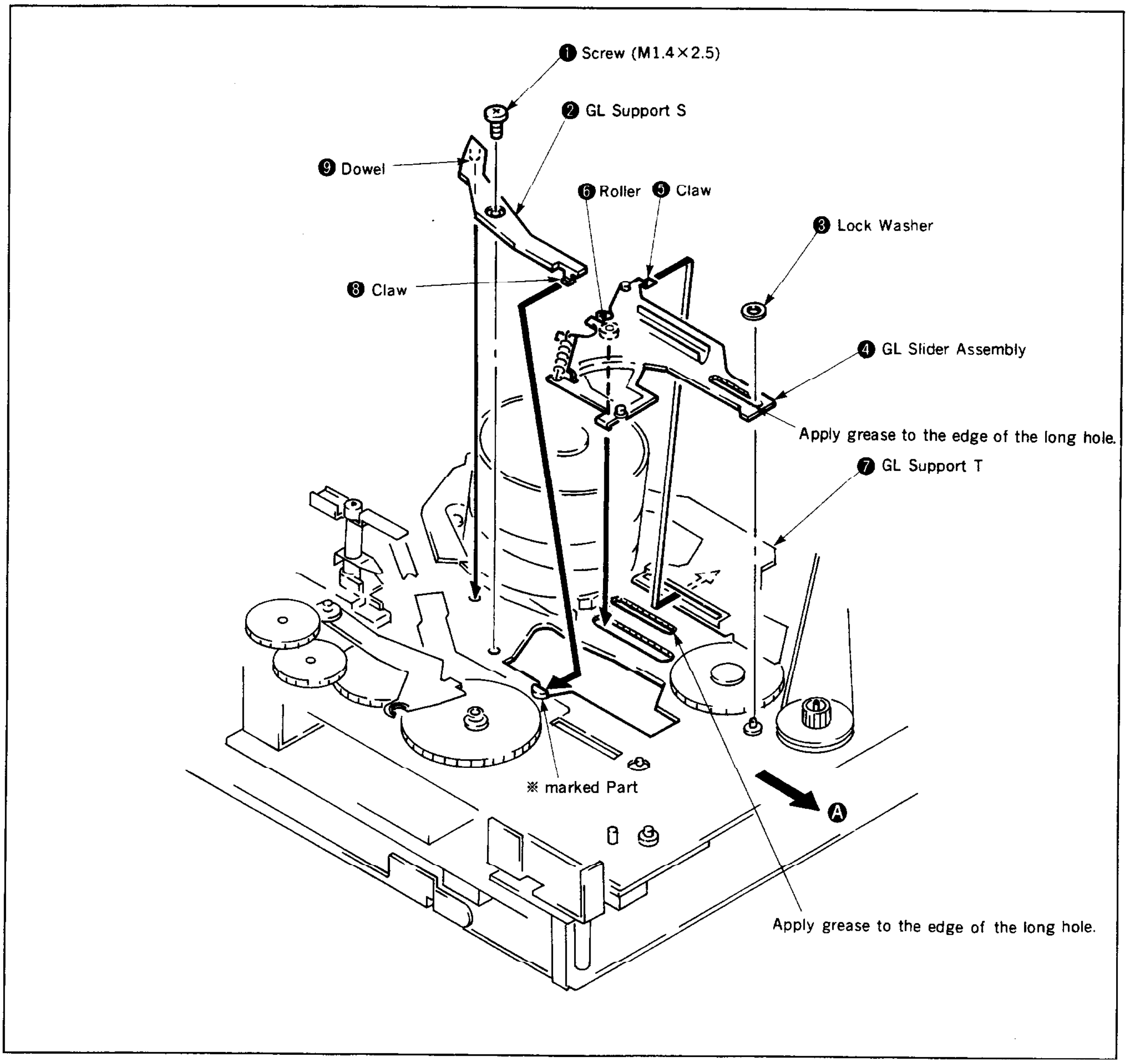

❶ Screw (M1.4×2.5)
❷ GL Support S
❾ Dowel
❻ Roller
❺ Claw
❸ Lock Washer
❽ Claw
❹ GL Slider Assembly
Apply grease to the edge of the long hole.
❼ GL Support T
※ marked Part
Ⓐ
Apply grease to the edge of the long hole.

Fig. 28

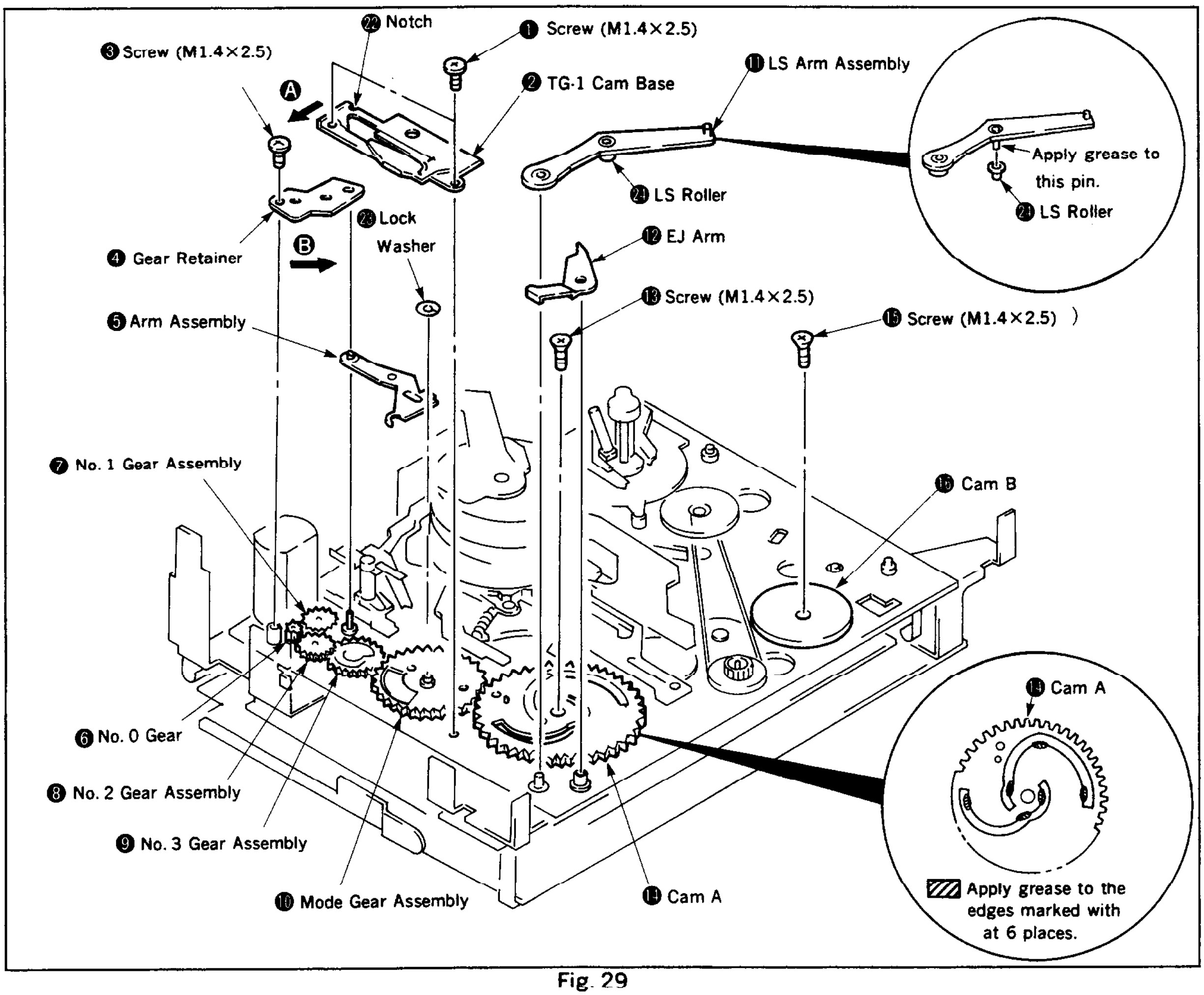
3-15 PHASE ADJUSTMENT(Fig. 29)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis. (Wen this is done, one of the BLANK, REC and READY modes must be selected.)
3) Remove the two screws ❶, and remove the TG-1 cam base ❷ by moving it in a direction of the arrowⒶ. (Remove the notch ㉒from the groove of the No. 3 gear shaft.)
4) Remove the screw ❸, and remove the gear retainer ❹ by sliding it in a direction of the arrowⒷ.
5) Remove the arm assembly ❺, No. 0 gear ❻, No. 1 gear assembly ❼, No. 2 gear assembly ❽, No. 3 gear assembly ❾, lock washer㉓, and then, mode gear assembly❿, respectively.
6) Being careful not to lose the LS roller㉔of the LS arm, remove the LS arm assembly⓫and EJ arm⓬, respectively.
7) Remove the screw⓭, and then, cam A⓮.
8) Referring to 3-13 3), remove the pinch press arm assembly.
9) Remove the screw⓯, and then, cam B⓰.

2. Adjustment and Mounting

1) Face the holeⓐ of the mode gear assembly❿to a direction of the arrowⒶ, move the GL slider assembly⓱in a direction of the arrowⒷ, apply molyton grease to the pin of the GL slider assembly⓱, and mount the LS roller⓲. (Fig. 30)
2) Set a direction of the cam A⓮so that the holeⒸ of the cam A ⓮will be aligned with the hole of the mechanical chassis. (Fig. 31)
3) Move the GL slider⓱so that the LS roller⓲will be placed into the grooveⓓ of the cam A⓮. At the same time, engage the mode gear assembly❿with the gear of the relay gear A⓳, and mount the cam A⓮. Insert a stick of about ϕ1.5mm in the hole Ⓒ of the cam A⓮. (Fig. 31)
4) Align the holeⓔof the cam B⓰with the hole of the mechanical chassis. At the same time, engage the relay gear B⓴ with the gear and mount it. (Fig. 32)
5) Referring to 3-13, mount the pinch press arm assembly.
6) Align the holeⓕ of the No. 3 gear assembly ❾ with the hole of the mechanical chassis, and at the same time, engage the mode gear assembly❿with the gear to mount. (Fig. 33)
7) Mount the No. 2 gear assembly ❽, No. 1 gear assembly ❼ and No. 0 gear ❻ in that order. Mount the arm assembly ❺ to the shaft and put the pin㉑in the groove of the No. 3 gear assembly ❾, (Fig. 34)
8) Put the TG-1 cam base ❷ in place, fit the notch㉒to the shaft and shift it in an arrow direction, and mount the screws ❶ and ❶in that order. (Fig. 35)
9) Put the gear retainer ❹ in place, slide it in an arrow direction and fix it with the screw ❸. (Fig. 36)
10) Seeing to it that the EJ arm⓬and the LS roller㉔of the LS arm assembly⓫are put in the grooveⓖof the cam A⓮, mount them in that order. (Fig. 29 and Fig. 30)
11) Referring to 3-7, mount the LS chassis assembly.
12) Referring to 1-1, mount the cassette compartment holder assembly.



㉒ Notch
❶ Screw (M1.4×2.5)
❸ Screw (M1.4×2.5)
❷ TG-1 Cam Base
⓫ LS Arm Assembly
Ⓐ
㉔ LS Roller
Apply grease to this pin.
㉔ LS Roller
㉓ Lock Washer
❹ Gear Retainer
Ⓑ
⓬ EJ Arm
⓭ Screw (M1.4×2.5)
❺ Arm Assembly
⓯ Screw (M1.4×2.5))
❼ No. 1 Gear Assembly
⓰ Cam B
⓮ Cam A
❻ No. 0 Gear
❽ No. 2 Gear Assembly
❾ No. 3 Gear Assembly
❿ Mode Gear Assembly
⓮ Cam A
▨ Apply grease to the edges marked with at 6 places.

Fig. 29

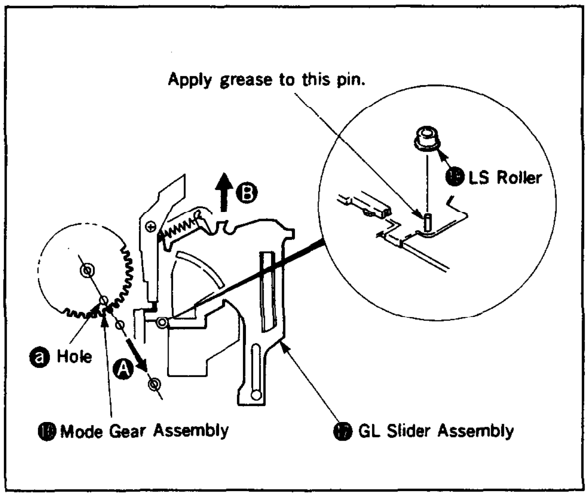

Apply grease to this pin.
⑬ LS Roller
Ⓑ
ⓐ Hole
Ⓐ
⑩ Mode Gear Assembly
⑰ GL Slider Assembly

Fig. 30

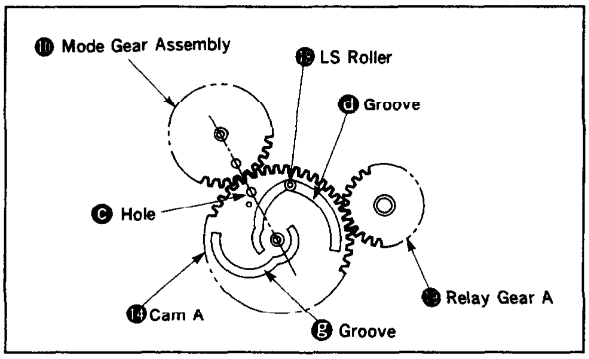

⑩ Mode Gear Assembly
⑬ LS Roller
ⓓ Groove
ⓒ Hole
⑮ Relay Gear A
⑭ Cam A
ⓖ Groove

Fig. 31

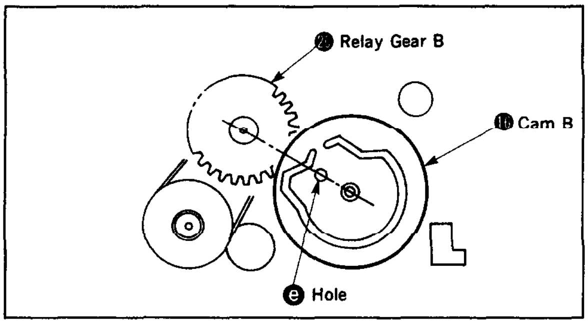

㉓ Relay Gear B
⑯ Cam B
ⓔ Hole

Fig. 32

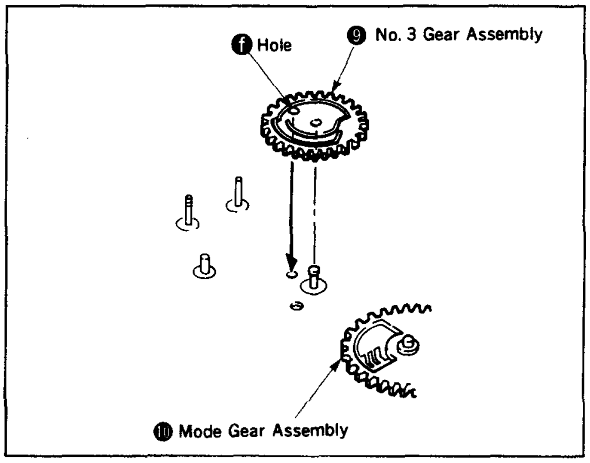

ⓕ Hole
⑨ No. 3 Gear Assembly
⑩ Mode Gear Assembly

Fig. 33

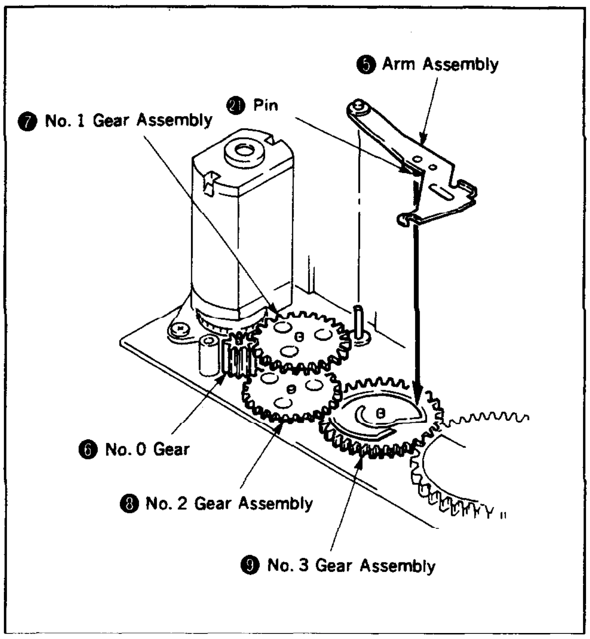

⑤ Arm Assembly
㉑ Pin
⑦ No. 1 Gear Assembly
⑥ No. 0 Gear
⑧ No. 2 Gear Assembly
⑨ No. 3 Gear Assembly

Fig. 34

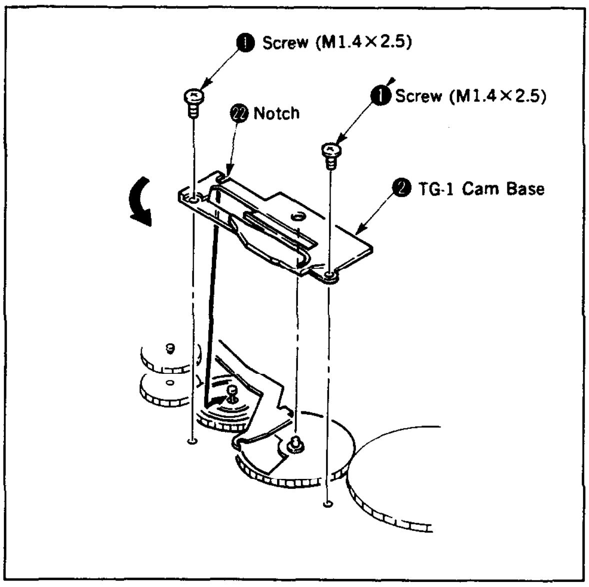

① Screw (M1.4×2.5)
① Screw (M1.4×2.5)
㉒ Notch
② TG-1 Cam Base

Fig. 35

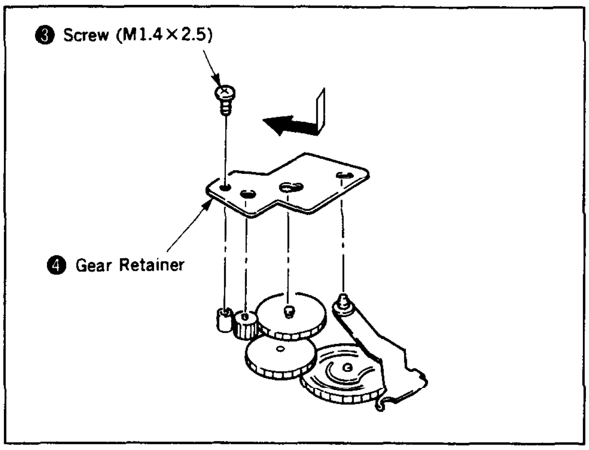

③ Screw (M1.4×2.5)
④ Gear Retainer

Fig. 36

3-16 GEAR TRAIN OPERATION CHECK (Fig. 37)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-7, remove the LS chassis.
3) Referring to 3-17, remove the loading motor.

2. Check

1) Insert the tip of tweezers into the hole a of the cam A ❶.
2) Rotate the cam A ❶ by about two thirds of a turn in a direction of the arrow Ⓐ, and then, in a direction of the arrow Ⓑ by the same amount. Repeat this 3 times.
3) When this is done, check that each, gear, the CL slider assembly and LS arm assembly rotate smoothly, and that no load is applied to them.
4) At the same time, check that the LS roller ❷ is located almost at the end point of the groove of the cam A ❶ when the gear train comes into contact with the stoppers at both ends.

Note : When rotating the cam A ❶ with the tip of tweezers, etc., be careful not to scratch the mechanical chassis.

3. Mounting

1) Referring to 3-17, mount the loading motor.
2) Referring to 3-7, mount the LS chassis assembly.
3) Referring to 1-1, mount the cassette compartment holder assembly.

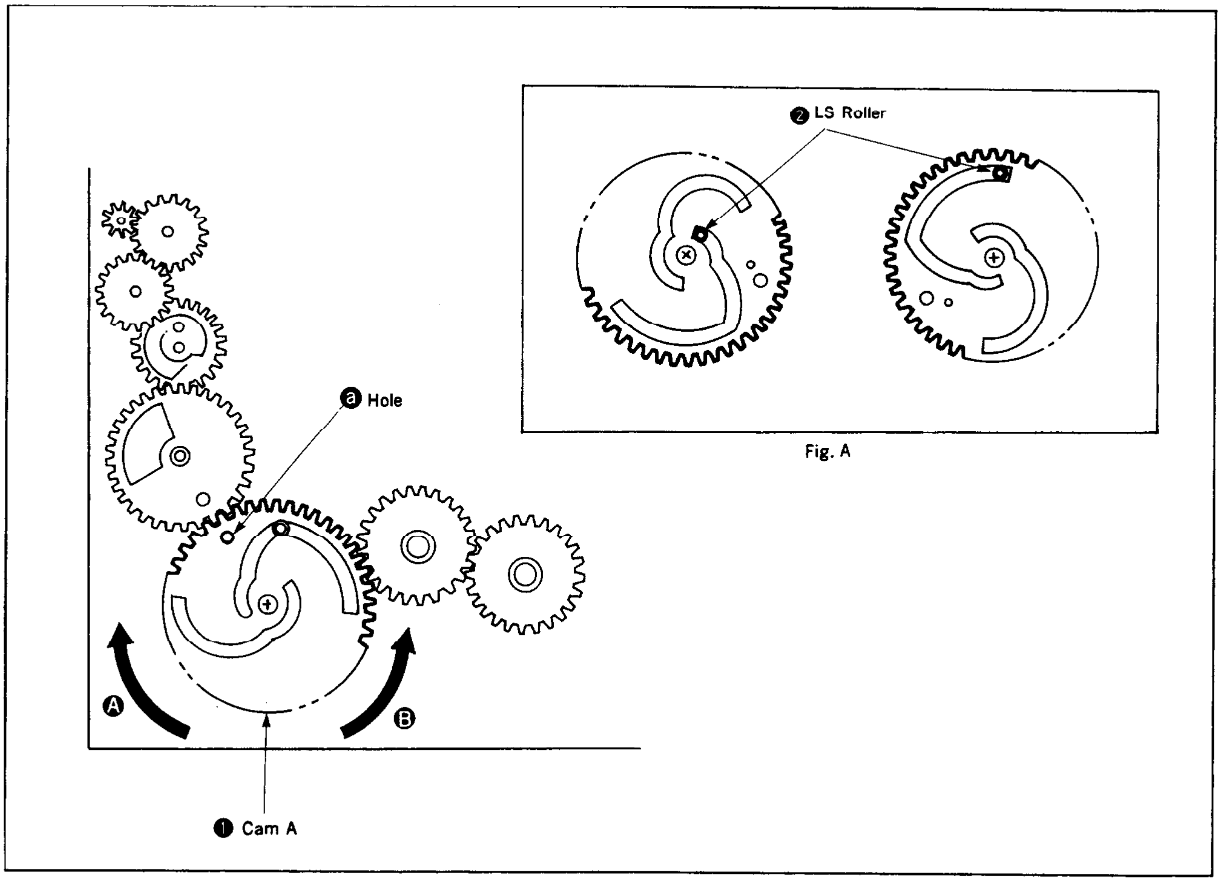


Fig. 37

3-17 LOADING MOTOR ASSEMBLY (Fig. 38)

1. Removal

1) Remove the LB-12 board.
2) Remove the connector ❶.
3) Remove the screws ❷ and ❸, and remove the loading motor assembly ❹ in an arrow direction.

2. Mounting

1) Put the pin ❺ of the loading motor assemmbly ❹ in the hole of the mechanical chassis, and mount it with the screws ❷ and ❸ in that order.
2) Mount the connector ❶.
3) Mount the LB-12 board.

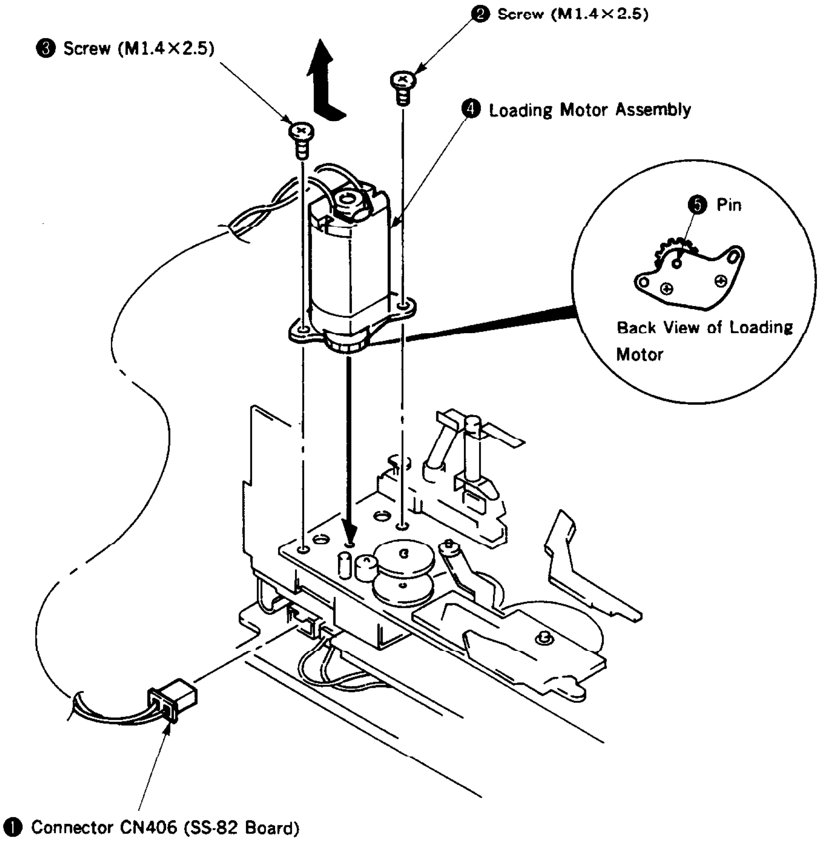

❷ Screw (M1.4×2.5)
❸ Screw (M1.4×2.5)
❹ Loading Motor Assembly
❺ Pin
Back View of Loading Motor
❶ Connector CN406 (SS-82 Board)

Fig. 38

3-18 GUIDE RAIL BASE 1 ASSEMBLY (Fig. 39)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Unskate the LS chassis a little.
3) Remove the two screws ●, and then, guide rail base 1 assembly ●.

Note : Be careful not to lose the spacers inserted in the parts ⓐ and ⓑ of the guide rail base 1 assembly ●. (Fig. B)

2. Mounting

1) Apply half a drip each of molyton grease at 2 places on the back of the guide rail base 1 assembly. (Fig. A)
2) Put the pin ● of the guide rail base 1 assembly ● in the notch of the chassis, and tighten the two screws ● with a torgue of 0.6kg•cm.
3) Referring to 1-1, mount the cassette compartment holder assembly.

Note1 : Mount paying attention to the number of spacers inserted and their locations.

Note2 : When tightening the screws, be careful not to bend the TG-2 upper flange ● with a screwdriver bit.

Note3 : Note that the part c of the guide rail base 1 assembly is easily broken. (Fig. B)

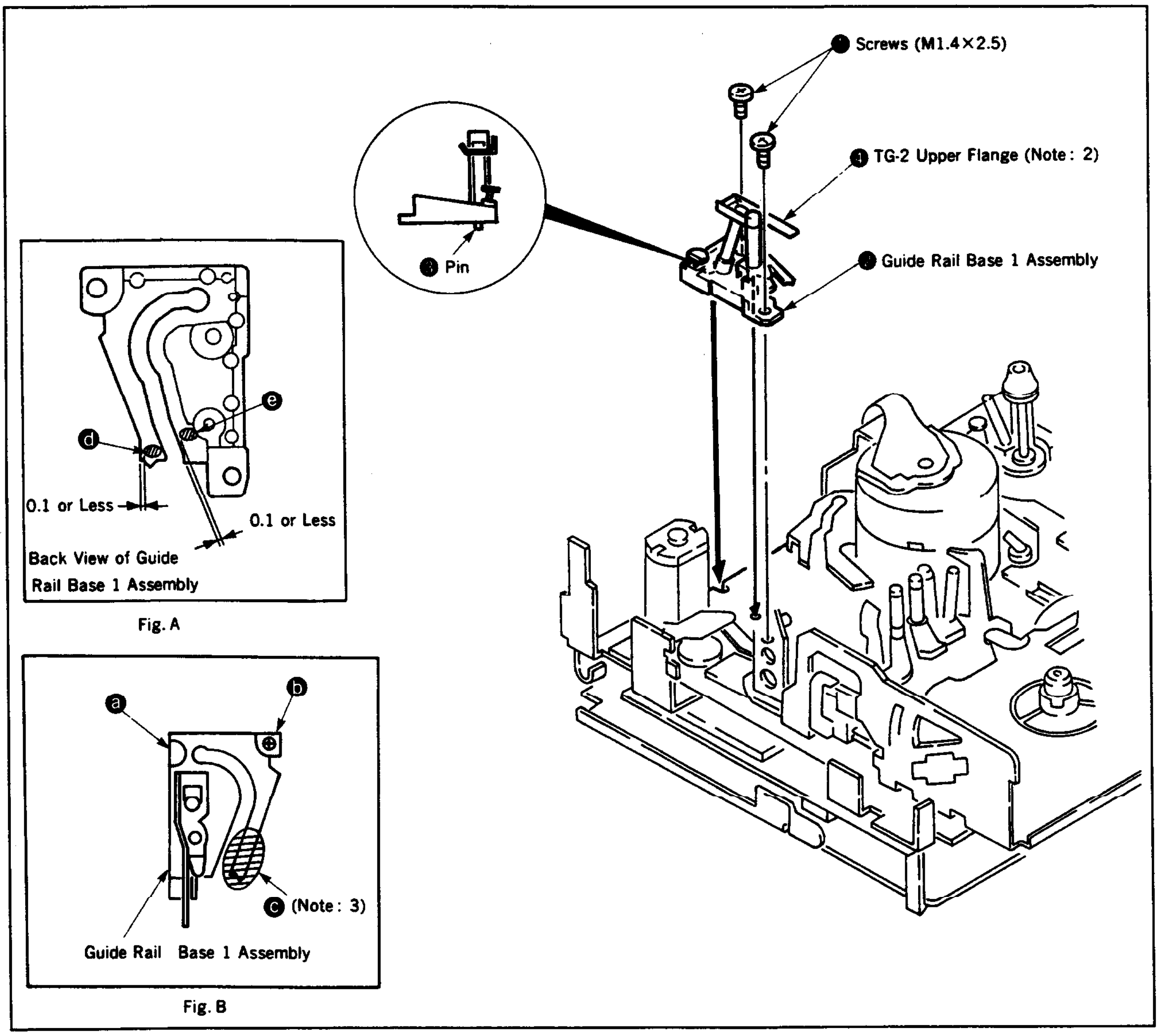

● Screws (M1.4×2.5)
● TG-2 Upper Flange (Note: 2)
● Guide Rail Base 1 Assembly
● Pin
ⓓ
ⓔ
0.1 or Less
0.1 or Less
Back View of Guide Rail Base 1 Assembly
Fig. A
ⓐ
ⓑ
ⓒ (Note: 3)
Guide Rail Base 1 Assembly
Fig. B

図39.

3-19 GUIDE RAIL BASE 2 ASSEMBLY (Fig. 40)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to the Service Manual, open the board in the back of the mechanical chassis.
3) Remove the four screws ❶, and then, frame B assembly ❷ in a direction of the arrowⒶ.
4) Unskate the LS chassis a little.
5) Remove the two screws ❸, and then, guide rail base 2 assembly ❹ in a direction of the arrowⒷ.

Note : Be careful not to hit the drum with a screwdriver bit because the screws are located closed to a drum lead.

2. Mounting

1) Apply half a drip of molyton grease each to 4 places on the back of the guide rail base 2 assembly. (Fig. A)
2) As shown in Fig. B, apply the striking parts of the guide rail base 2 assembly ❹ to the lower drum, and slide in an arrow direction to fit.
3) Pushing the part ※ of the guide rail base 2 assembly ❹ lightly in a direction of ⓔ (Fig. B), tighten the two screws ❸ with a torque of 0.8kg•cm.

Note : Note that the part f is easily broken.

4) Mount the frame B assembly with the four screws ❶.
5) Mount the opened board to the back of mechanical chassis.
6) Referring to 1-1, mount the cassette compartment holder assembly.

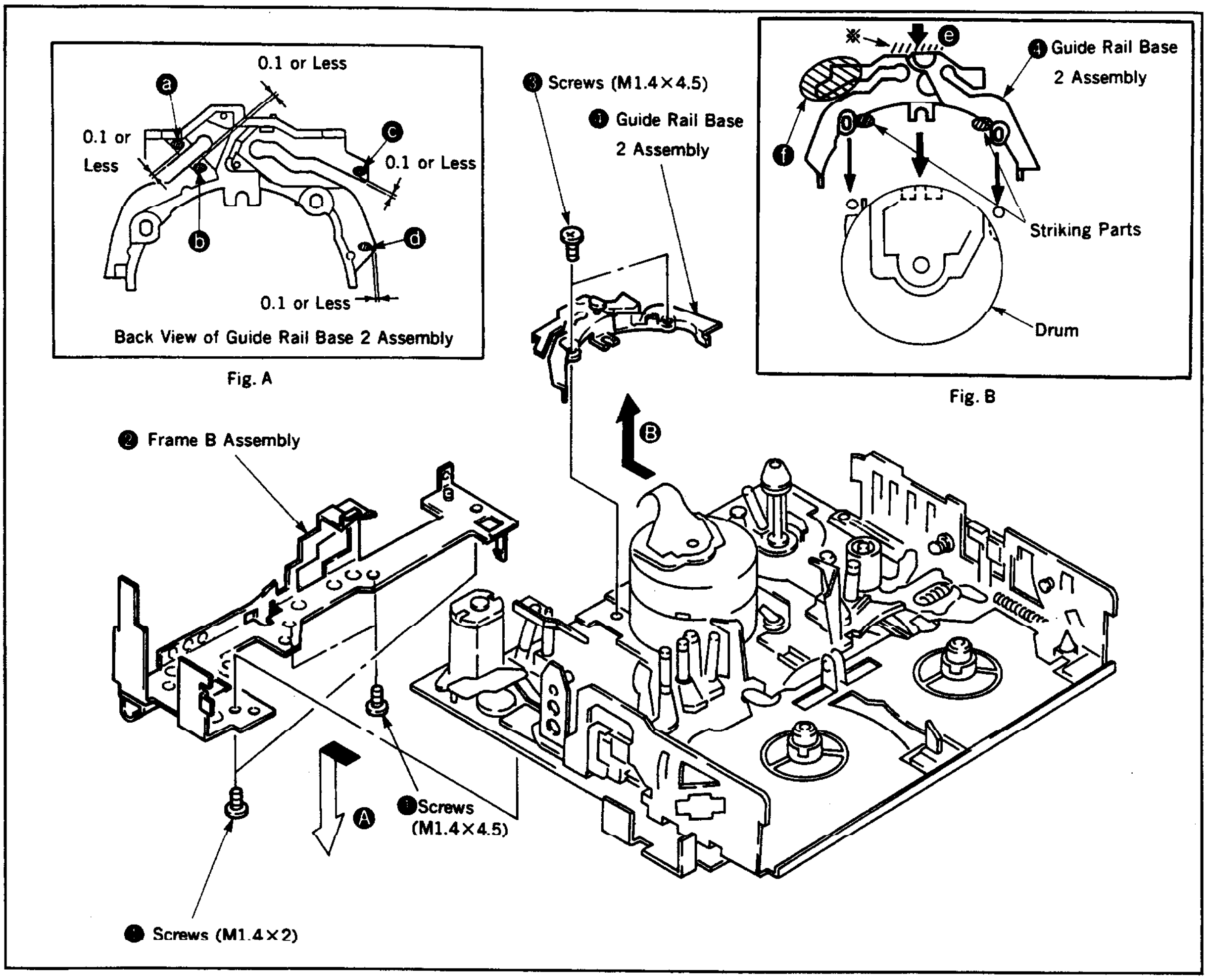

0.1 or Less
ⓐ
0.1 or Less
ⓒ
0.1 or Less
ⓑ
ⓓ
0.1 or Less
Back View of Guide Rail Base 2 Assembly
❸ Screws (M1.4×4.5)
❹ Guide Rail Base 2 Assembly
※
ⓔ
❹ Guide Rail Base 2 Assembly
ⓕ
Striking Parts
Drum
Ⓑ
❷ Frame B Assembly
❶Screws (M1.4×4.5)
Ⓐ
❶ Screws (M1.4×2)

Fig. A

Fig. B

Fig. 40

3-20 GUIDE RAIL BASE 3 ASSEMBLY (Fig. 41)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Remove the flexible rotatry shaft ●.
3) Remove the two screws ●. Remove the guide rail base 3 assembly ● in an arrow direction, seeing to it that it does not hitch on the capstan housing.

Note : Handle the ✱ marked part carefully because it is easily broken.

2. Mounting

1) Apply half a drip of molyton grease each to 2 places on the back of the guide rail base 3 assembly ●. (Fig. A)
2) Mount the guide rail base 3 assembly ●, seeing to it that it does not hitch on the capstan housing.
3) Tighten the two screws ● with a torque of 0.6kg•cm.
4) Mount the flexible rotary shaft ●.
5) Referring to 1-1, mount the cassette compartment holder assembly.

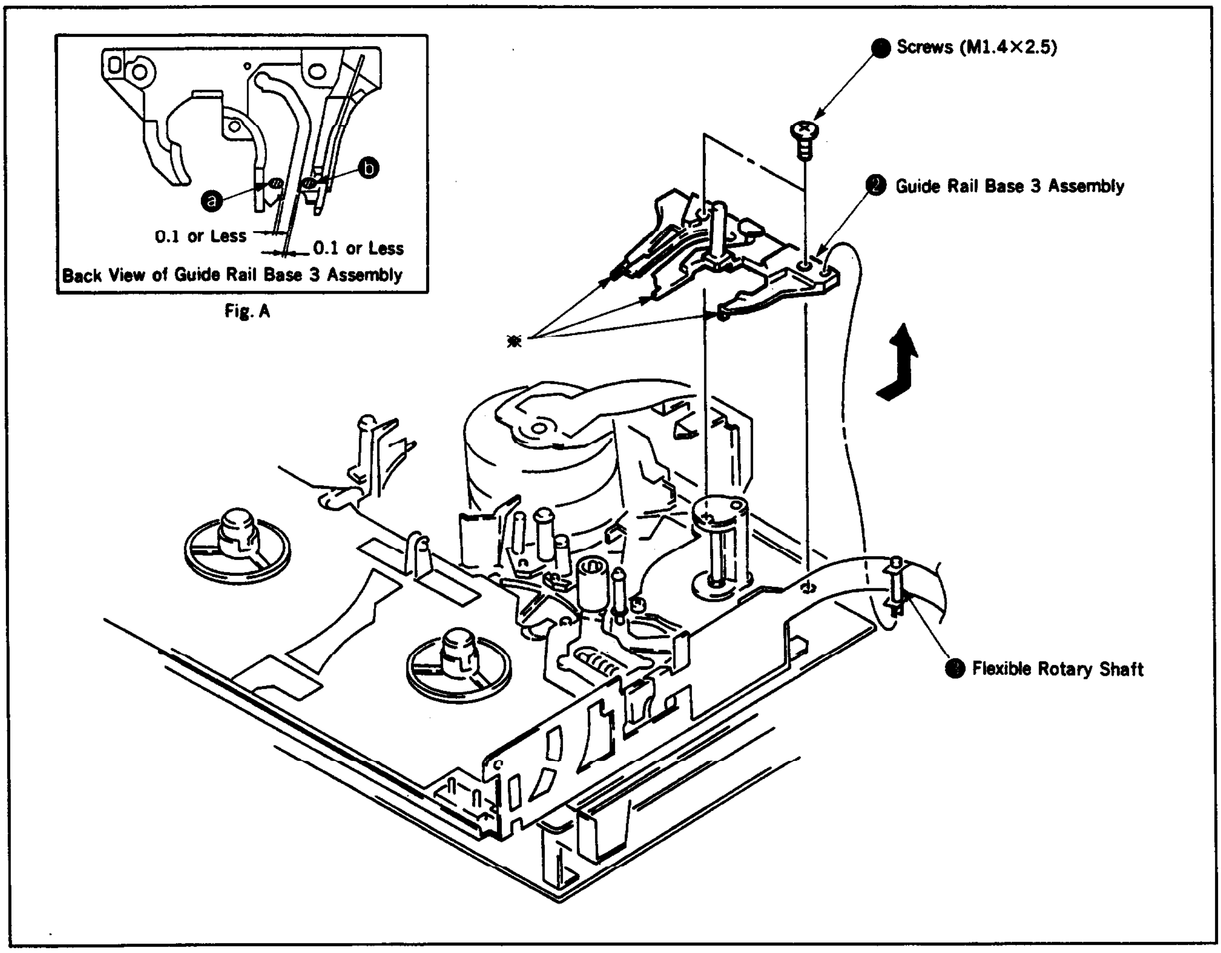

ⓐ
ⓑ
0.1 or Less
0.1 or Less
Back View of Guide Rail Base 3 Assembly
Fig. A
● Screws (M1.4×2.5)
● Guide Rail Base 3 Assembly
✱
● Flexible Rotary Shaft

Fig. 41

3-21 CAPSTAN MOTOR ASSEMBLY (Fig. 42)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-20, remove the guide rail base 3 assembly.
3) Remove the connector ● of the capstan motor assembly ●.
4) Remove the screw ●. Disengaging the gear of the conversion gear assembly ●, remove the capstan motor assembly ● in an arrow direction (obliquely).

2. Mounting

1) As shown in Fig. A, incline the capstan motor assembly ● to engage the gear of the capstan motor assembly ● with that of the conversion gear assembly ●, and tighten the screw 3 with a torque of 1kg•cm.
   When this is done, be careful not to damage the gear of the conversion gear assembly ●.
2) Mount the connector 2 to the capstan motor assembly ●.
3) Referring to 3-20, mount the guide rail base 3 assembly.
4) Referring to 1-1, mount the cassette compartment holder assembly.

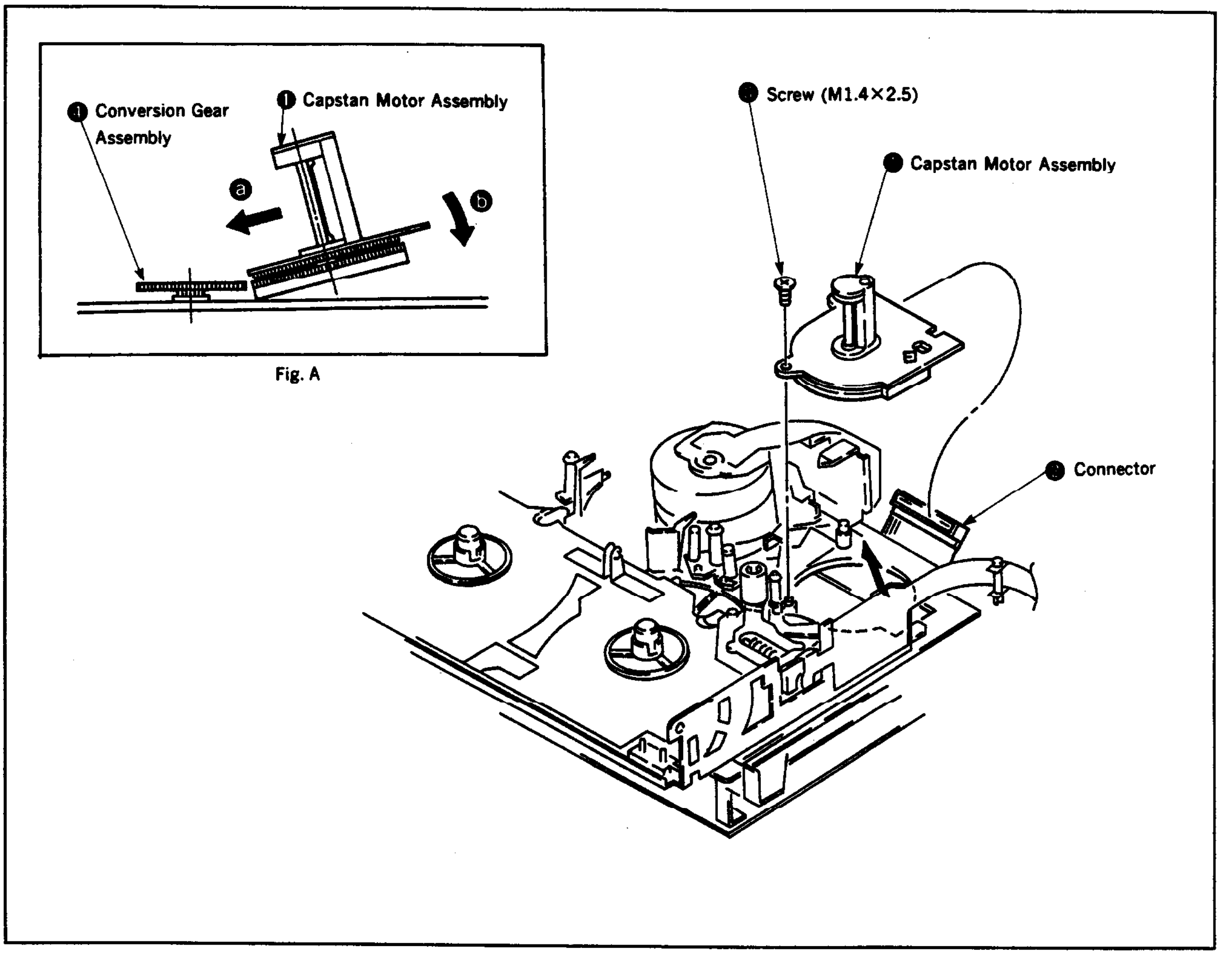

● Conversion Gear Assembly
● Capstan Motor Assembly
ⓐ
ⓑ
Fig. A
● Screw (M1.4×2.5)
● Capstan Motor Assembly
● Connector

Fig. 42

3-22 DRUM BASE ASSEMBLY (Fig. 42)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Remove the motor flexible board ● from the board.
3) Referring to 3-19, remove the guide rail base 2 assembly.
4) Remove the two screws ●.
5) Draw out the head flexible board ● carefully from the hole of the mechanical chassis not to damage it, and remove the drum base assembly.

2. Mounting

1) Put the head flexible board ● in the hole of the mechanical chassis and put the positioning pins ● of the drum base in the holes of the mechanical chassis.
2) Tighten the two screws ● with a torque of 0.8kg•cm.
3) Referring to 3-19, mount the guide rail base 2 assembly.
4) Mount the motor flexible board ● to the board.
5) Referring to 1-1, mount the cassette compartment holder assembly.

Note : After mounting, make tape path adjustment in Section 4.

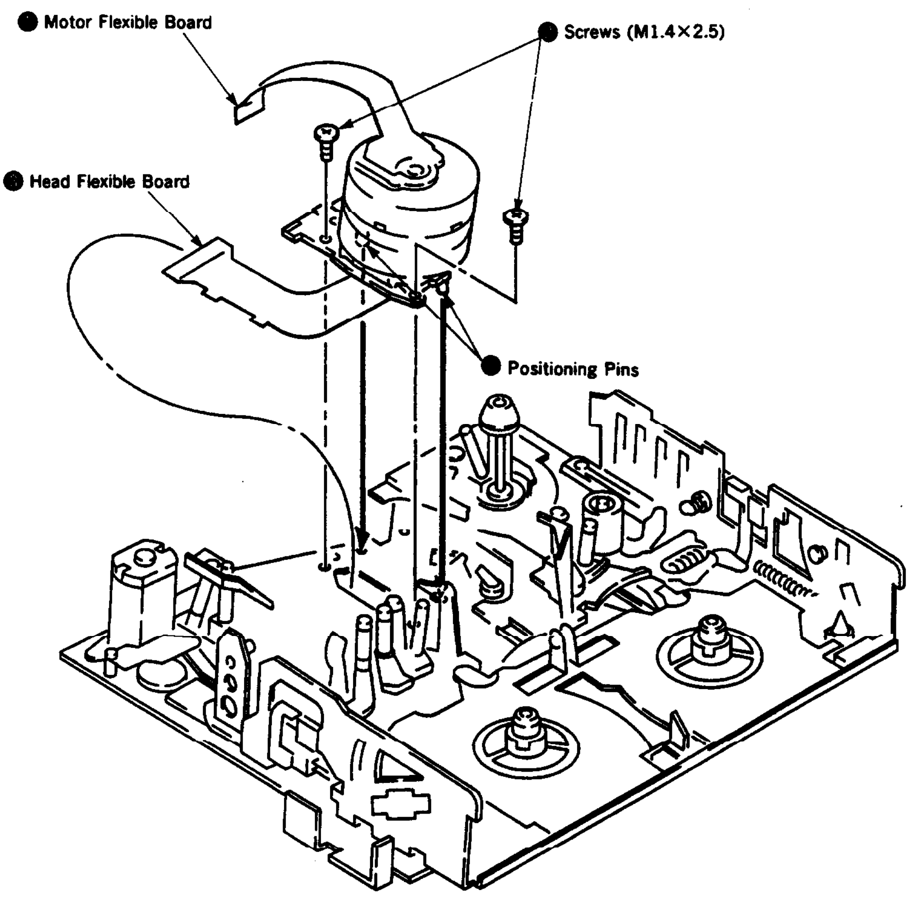


Fig. 42

3-23 DRUM ASSEMBLY (Fig. 43)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Remove the motor flexible board ● from the board.
3) Referring to 3-19, remove the guide rail base 2 assembly.
4) Remove the three screws ● from the back of the mechanical chassis.
5) Draw out the head flexible board ● carefully from the hole of the mechanical chassis not to damage it, and remove the drum assembly ●.

2. Mounting

1) Put the head flexible board ● in the hole of the mechanical chassis, and mount it so that the pins ⓑ and ⓓ will be put in the holes ⓐ and ⓒ shown in Fig. A.
2) Tighten the three screws ● with a torque of 0.5kg•cm.
3) Referring to 3-19, mount the guide rail base 2 assembly.
4) Mount the motor flexible board ● to the board.
5) Referring to 1-1, mount the cassette compartment holder assembly.

Note : After mounting, make tape path adjustment in Section 4.

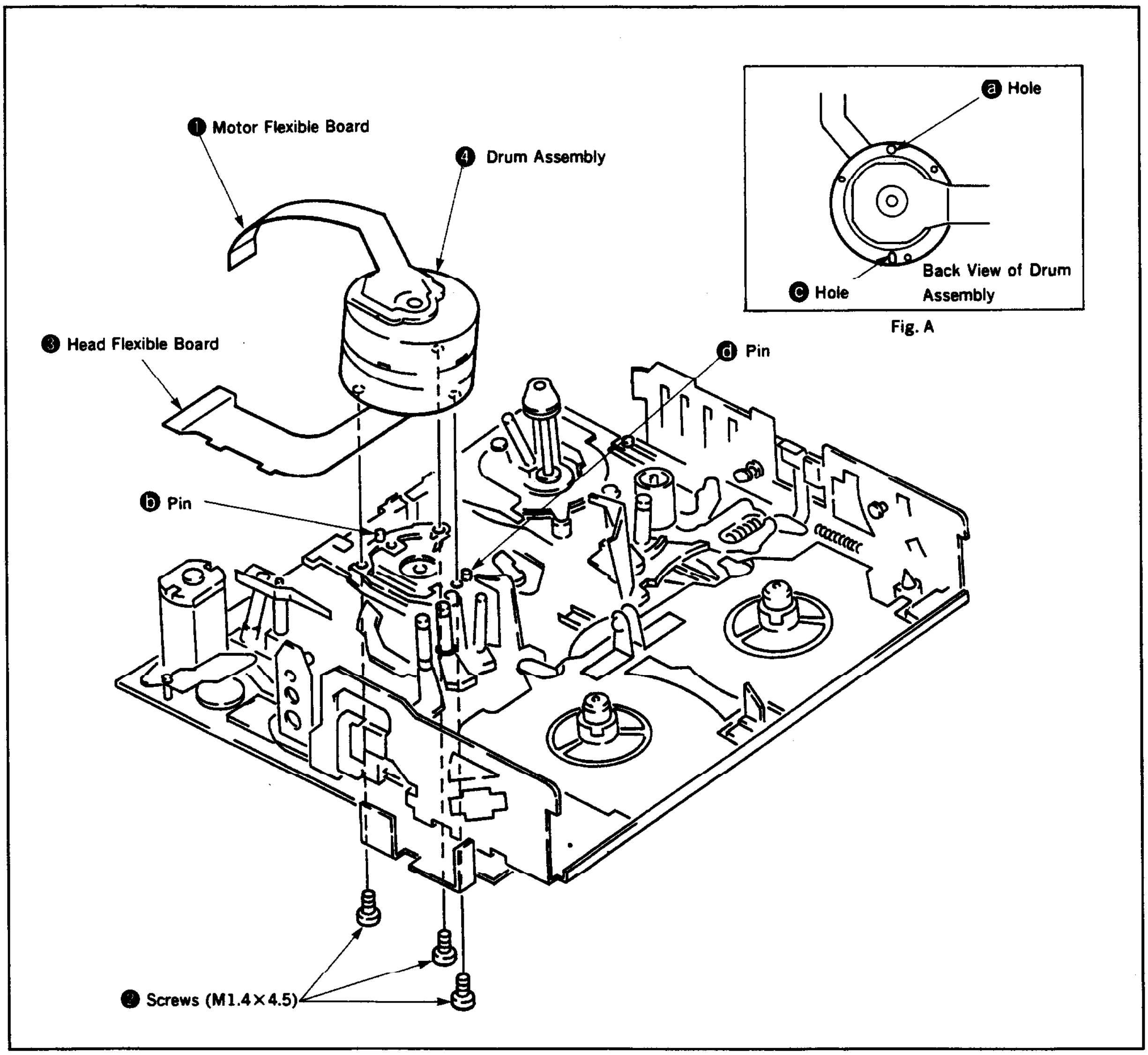
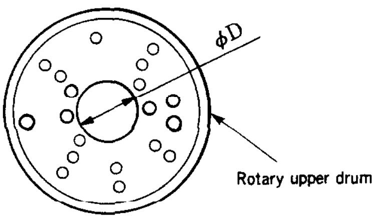

❶ Motor Flexible Board
❹ Drum Assembly
❸ Head Flexible Board
ⓑ Pin
ⓓ Pin
● Screws (M1.4×4.5)
ⓐ Hole
ⓒ Hole
Back View of Drum Assembly
Fig. A

Fig. 43

3-24 Replacement of Rotary Upper Drum Assembly

There are two rotary upper drum assembly types, depending on a color mark. (Fig. A in Fig. 45)



NTSC:

A-7049-190-A	Rotary upper drum assembly DGR-32-R-(1)
A-7049-189-A	Rotary upper drum assembly DGR-32-R-(2)

PAL:

A-7049-197-A	Rotary upper drum assembly DGR-37-R-(1)
A-7049-198-A	Rotary upper drum assembly DGR-37-R-(2)

Manufacturing upper dram

RANK	ϕD	MARK	
A	$\phi 8^{+0.0015}_{+0.001}$	Green	−01
B	$\phi 8^{+0.001}_{+0.0005}$	Green, Brown	
C	$\phi 8^{+0.0005}_{0}$	Black	
D	$\phi 8^{0}_{-0.0005}$	Black, Brown	
E	$\phi 8^{-0.0005}_{-0.001}$	Red	−11
F	$\phi 8^{-0.001}_{-0.0015}$	Red, Brown	
G	$\phi 8^{-0.0015}_{-0.002}$	Blue	
H	$\phi 8^{-0.002}_{-0.0025}$	Blue, Brown	

Repairing upper drum

SUFFIX	ϕD	REMARKS	DRUM UPPER
−01	$\phi 8^{+0.001}_{+0.0005}$	Green, Brown	NTSC DGR-32-R-(1) PAL DGR-37-R-(1)
	$\phi 8^{+0.0005}_{0}$	Black	
−11	$\phi 8^{-0.001}_{-0.0015}$	Red, Brown	NTSC DGR-32-R-(2) PAL DGR-37-R-(2)
	$\phi 8^{-0.0015}_{-0.002}$	Blue	

1. Removal

1) Referring to 3-23, remove the drum assembly.
2) Remove the two screws ❶. (Fig. 44)
3) Hold the outlet (base) of the guide protector ❷, lift it up obliquely. In that state, hold the outer figure of the back yoke ❸ and remove it. (Fig. 44)

Note: Note that the flexible board and guide protector ❷ easily come off position because they are only pasted.

4) As shown in Fig. A, set the rotor earth spring ❹ around spring hook. (Fig. 44)
5) Using a drum screwdriver (Ref. No. J-11), remove the two hexagon socket bolts ❺, and then, rotary upper drum assembly ❻. (Fig. 45)
6) Using the drum screwdriver (Ref. No. J-11), remove the two hexagon socket bolts ❼, and then, rotor ❽. (Fig. A in Fig. 45)

2. Mounting

1) Clean the flange surface❿and the surface of the rotary upper drum assembly ❻ which comes into contact with it, and make sure that there is no dust or scratch. (Fig. 45)
2) Adjust a direction of the upper drum so that the head contact mold pin⓫will be put in the reference hole of the rotary upper drum assembly ❻, and push it in lightly. (Fig. 45)

Note: Check visually that the clearance between the upper and lower drums is about 0.05mm.

3) Using the drum screwdriver (Ref. No. J-11), tighten the two hexagon socket bolts ❺ (800g·cm) and rotate it with finger to make sure that there is no abnormality. (Fig. 45)
4) Put the pin ❾ of the rotor ❽ in the hole of the rotary upper drum assembly. Using the drum screwdriver (Ref. No. J-11), tighten the hexagon socket bolts ❼. (800g·cm) (Fig. A in Fig. 45)
5) Remove the rotor earth spring ❹ from the spring hook. Using tweezers, etc., hook it onto the groove of the stator boss⓬. (Fig. B in Fig. 45)

Note: See to it that the rotor earth spring ❹ is not located in the gap between the flange and stator.

6) Hold the outer figure of the back yoke ❸, put it on the inner step of the upper drum and insert the other side slowly. (Fig. B in Fig. 44)
7) Tighten the two screws ❶. (500g·cm) (Fig. 44)
8) Rotate the upper drum with finger to check that it runs smoothly.
9) Referring to 3-23, mount the drum assembly.

Note: After mounting, be sure to make tape path adjustment in Section 4.

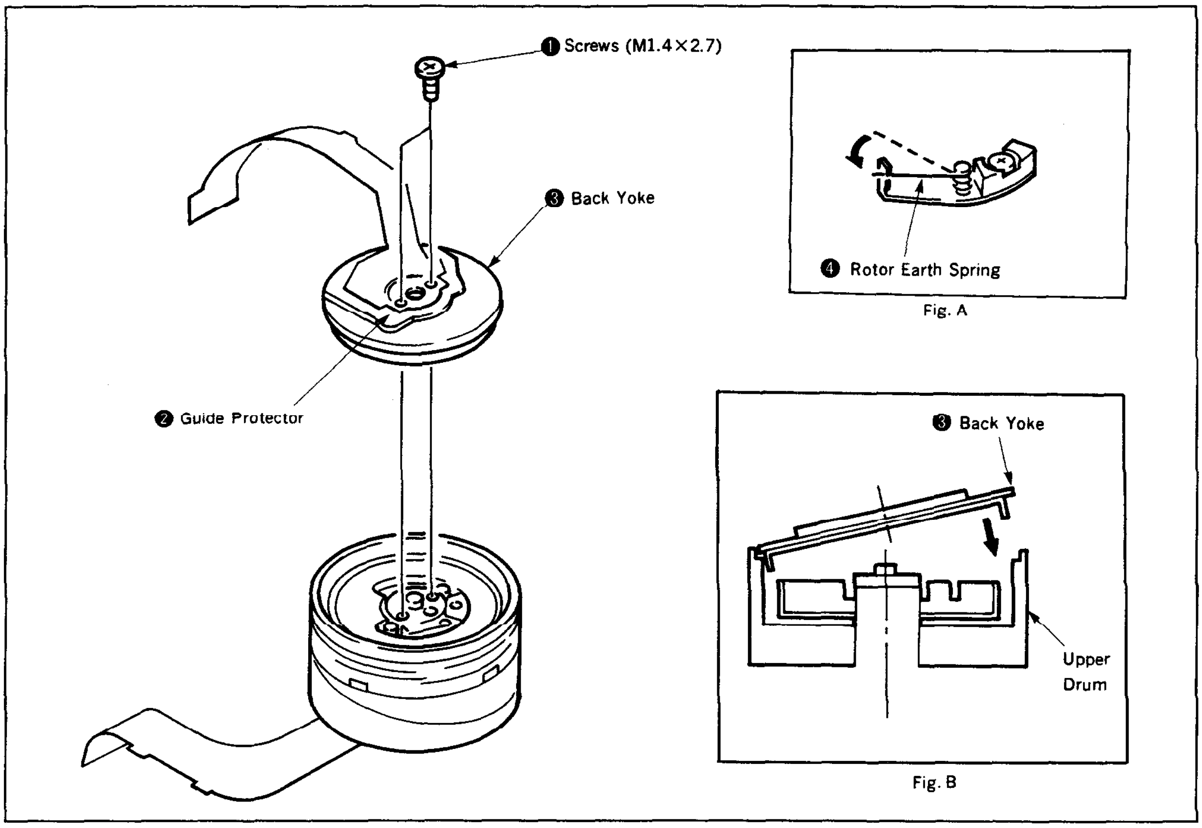

❶ Screws (M1.4×2.7)
❸ Back Yoke
❷ Guide Protector
❹ Rotor Earth Spring
❸ Back Yoke
Upper Drum

Fig. A

Fig. B

Fig. 44

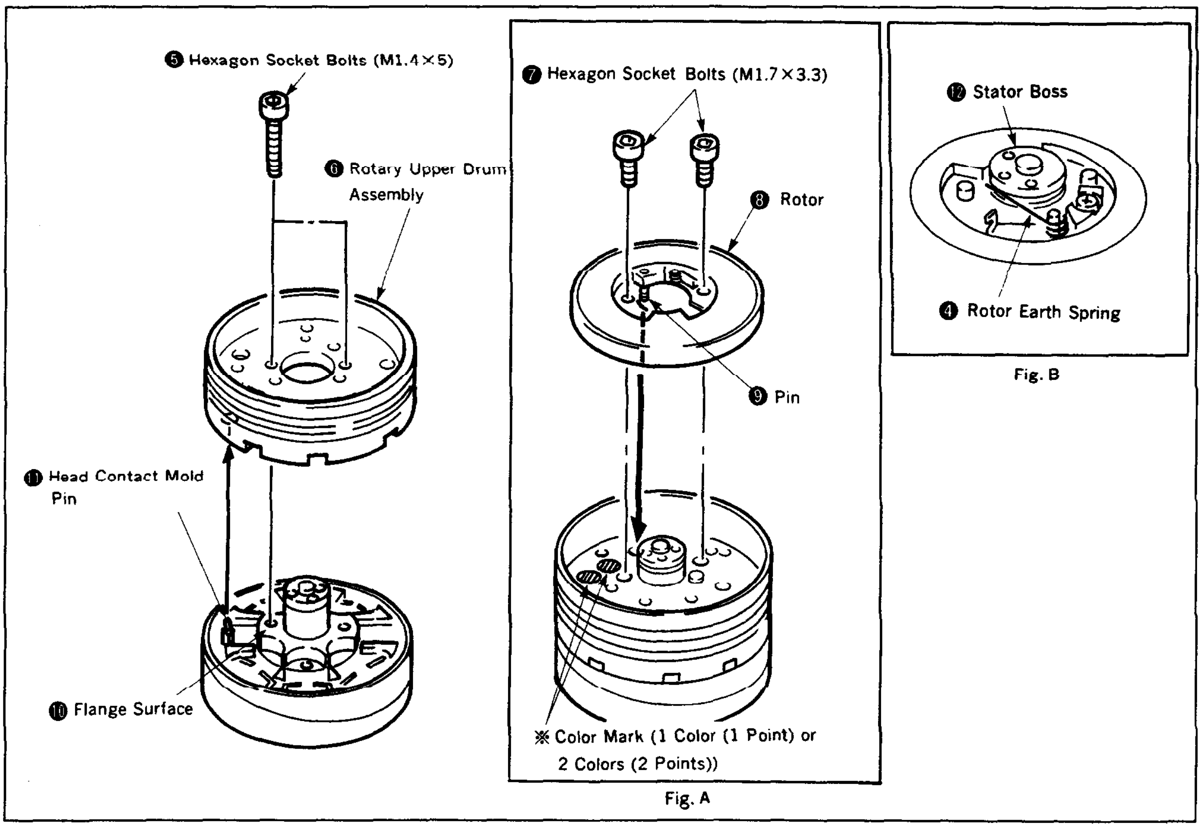

❺ Hexagon Socket Bolts (M1.4×5)
❻ Rotary Upper Drum Assembly
⓫ Head Contact Mold Pin
❿ Flange Surface
❼ Hexagon Socket Bolts (M1.7×3.3)
❽ Rotor
❾ Pin
※ Color Mark (1 Color (1 Point) or 2 Colors (2 Points))
⓬ Stator Boss
❹ Rotor Earth Spring

Fig. A

Fig. B

Fig. 45

3-25 REEL TABLE HEIGHT CHECK (Fig. 46)

1. Removal

1) Referring to 1-1, remove the cassette compartment holder assembly.
2) Referring to 3-1, remove the LED base.

2. Check

1) Using slide calipers, etc., check that distances from the LS chassis to the S reel table reel resting surface ❷ and T reel table reel resting surface ❸ are respectively as shown in below.

3. Mounting

1) Referring to 3-1, mount the LED base.
2) Referring to 1-1, mount the cassette compartment holder assembly.

A: $3.2^{+0.2}_{-0.15}$mm
B: 3.2 ± 0.15mm

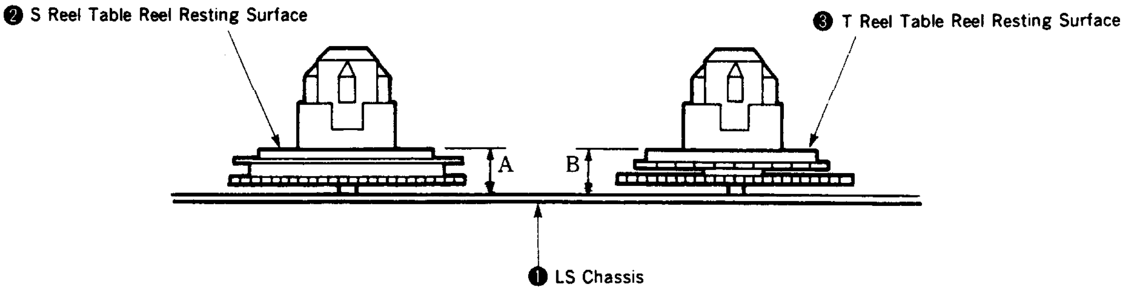

❷ S Reel Table Reel Resting Surface
❸ T Reel Table Reel Resting Surface
A
B
❶ LS Chassis

Fig. 46

3-26 FWD/RVS TORQUE CHECK

1) Set the FWD/RVS take-up torque cassette (Ref. No. J-10).
2) In the FWD mode, check that a T reel torque value is 5 – 15g·cm.
3) Turn on the REC/REVIEW button and check that an S reel torque value is 25g·cm – 45g·cm.
4) When the values above are not met, replace the respective reel tables.

3-27 TENSION REGULATOR POSITION ADJUSTMENT

1. Removal

1) Referring to 1-1, remove the cassette compartment holder.

2. Adjustment

1) Set a cassette tape, select the REC mode and run the tape. (Refer to 1-3)
2) With the tape running, check that the distance between TG-1 and TG-2 is 9.35 – 10.7mm. (Fig. 47)
3) When they are not at specified positions, remove the cassette and go through the steps 4) on.
4) Referring to 3-1, remove the LED base.
5) Loosen the screw ❶.
6) When TG-1 is located inside (or outside) its specified position, shift the TG-1 adjustment block 2 slightly in a direction of the arrowⒶ (orⒷ) and fix with the screw ❶. (Fig. 48)
7) Referring to 3-1, mount the LED base.

Note : Use the cassette tape after feeding the tape as far as a middle point.

When taking the steps 4) and 5), remove the cassette tape first.

Check that TG1 is able to move in direction C during REC.

3. Mounting

1) Referring to 1-1, mount the cassette compartment holder assembly.

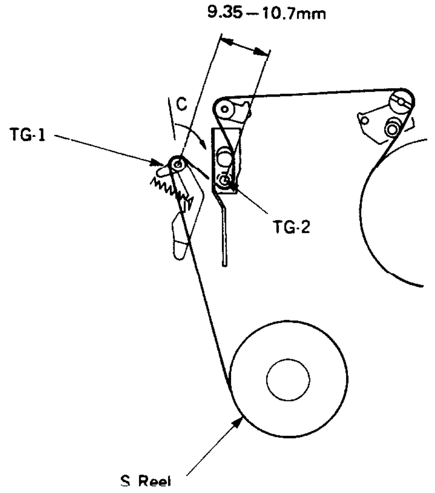


Fig. 47

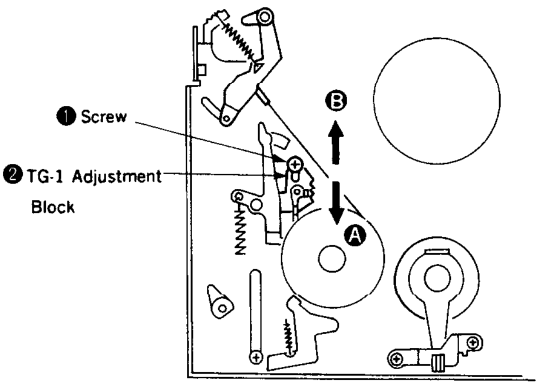


Fig. 48

3-28 FWD BACK TENSION ADJUSTMENT (Fig. 49)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-7, remove the LED base.

2. Adjustment

1) Select the $\boxed{\text{REC}}$ mode.
2) Set the tension measurement reel (Ref. No. J-8)●.
3) Using the dial tension gauge (Ref. No. J-7)●, measure a tape tension at the outlet of TG-2. When this is done, pull the tape at a rate of 14mm/sec.
4) Change the position of the tention regulator spring ● position as shown in Fig. A so that measure center value of the tention is 4−6.5g.

Note : When this is done, see to it that the gear ● is not engaged with the S reel table.

3. Mounting

1) Referring to 1-1, mount the cassette compartment holder assembly.
2) Referring to 3-1, mount the LED base.

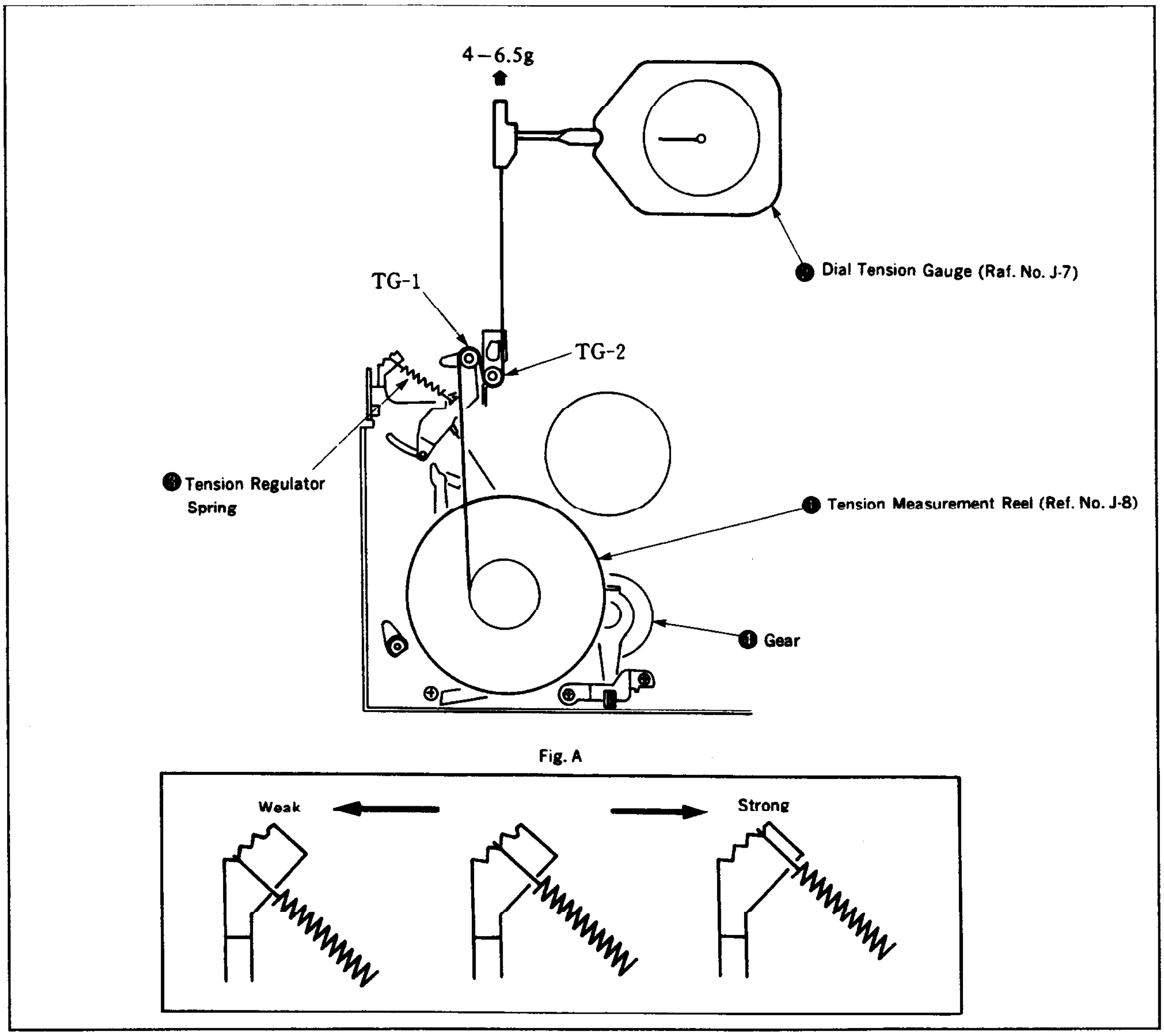

4−6.5g
TG-1
TG-2
● Dial Tension Gauge (Raf. No. J-7)
● Tension Regulator Spring
● Tension Measurement Reel (Ref. No. J-8)
● Gear
Fig. A
Weak
Strong

Fig. 49

4. TAPE PATH ADJUSTMENT

The 8mm video system uses ATF (Automatic Track Finding) which instantaneously controls a tape running speed based on 4 types of pilot signals and performs high-precision tracking.

This does away a tracking control knob and allows accurate track tracing.

On the other hand, however, the ATF system has a problem in adjusting the tape path system. That is, if head tracing is out of order a little, the ATF system automatically corrects it, which means that perfect adjustment cannot be done.

To avoid this problem, a track shift jig had been used to adjust the tape path system. In the FL (Q) mechanism, the ATF system is forcibly operated to shift a tracking amount constantly (approx. 1/4) by setting the PATH mode. So, fine tracking adjustment can be easily done.

No track shift jig is required any more.

Example) For CCD-V11/V88

CN404

4	GND
3	$\overline{\text{CAM ADJ}}$
2	$\overline{\text{TEST}}$
1	$\overline{\text{PATH}}$

The path mode is set by shorting the pins ① and ④.

4-1 PREPARATION FOR ADJUSTMENT

1) Clean the tape running surfaces (tape guides, drum, capstan shaft, pinch roller). (Fig. 51)
2) Set the PATH mode by shorting the TEST pins (CN404 pins ① and ④ for CCD-V11/V88).
3) Connect to an oscilloscope.
4) Play back a tracking alignment tape (NTSC: WR5-1N), (PAL: WR5-1C).
5) Check that a RF waveform is flat at the inlet and outlet of the oscilloscope. (Fig. 50 ⓐ)

   When it is not flat, make adjustment in accordance with the procedures below.

   When the RF waveform is not flat at the inlet/outlet; (Fig.50 ⓑ and ⓒ)

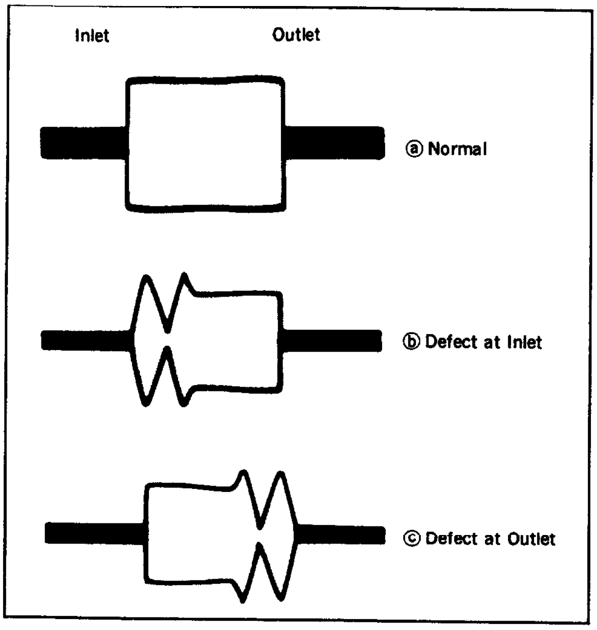

Inlet
Outlet
ⓐ Normal
ⓑ Defect at Inlet
ⓒ Defect at Outlet

Fig. 50

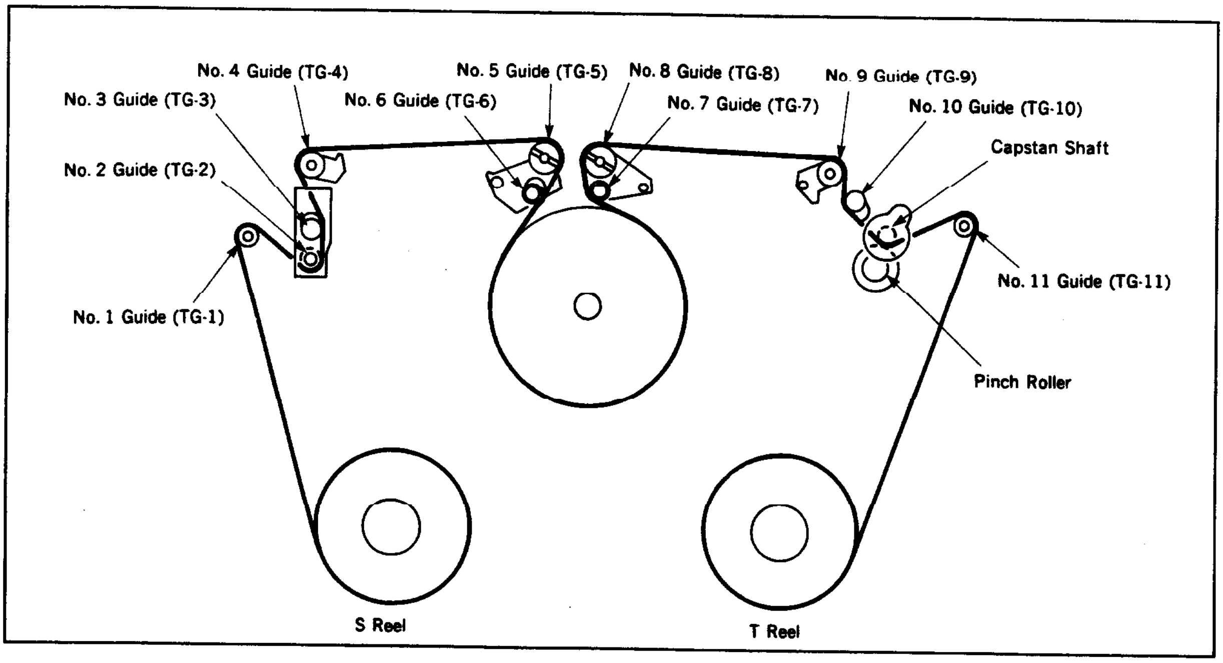

No. 4 Guide (TG-4)
No. 5 Guide (TG-5)
No. 8 Guide (TG-8)
No. 9 Guide (TG-9)
No. 3 Guide (TG-3)
No. 6 Guide (TG-6)
No. 7 Guide (TG-7)
No. 10 Guide (TG-10)
Capstan Shaft
No. 2 Guide (TG-2)
No. 11 Guide (TG-11)
No. 1 Guide (TG-1)
Pinch Roller
S Reel
T Reel

Fig. 51 Tape Guides Location

4-2 TRACKING ADJUSTMENT (Fig. 52)

1) Play back the tracking alignment tape.
2) Loosen the No. 5 guide (TG-5) lock screw ❶ and turn the No. 5 guide to flatten the waveform at the inlet.
3) Tighten the No. 5 guide (TG-5) lock screw ❶ to lock the No. 5 guide.
4) Loosen the No. 8 guide (TG-8) lock screw ❷ and turn the No. 8 guide to flatten the waveform at the outlet.
5) Tighten the No. 8 guide (TG-8) lock screw ❷ to lock the No. 8 guide. When this is done, make sure that the waveform does not change at the outlet.

Note : Be careful not to loosen the lock screw too much because the guide is easily moved.

Tape path Adjustment for "Guide Rail Base 2 with TG8 Gate Adjustment"

You do not have to adjust theTG-8 gate adjustment screw.

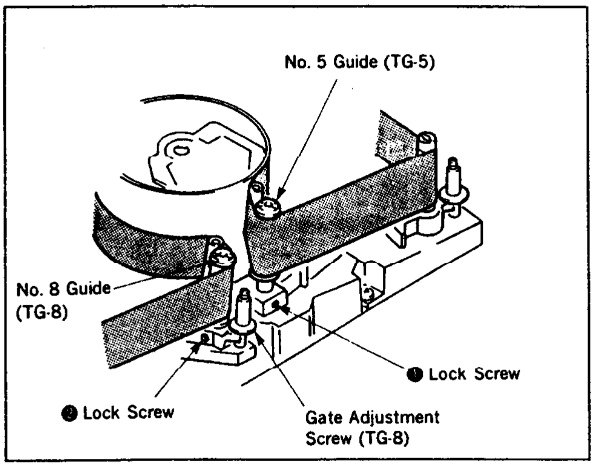


Fig. 52

4-3 NO. 4 GUIDE (TG-4) ADJUSTMENT

When an entire guide base is replaced, its height has been preste.

TG-4 Guide Height Presetting

1) With the top surface of the TG-4 guide leveled, rotate an upper flange by one turn. This is a preset height.

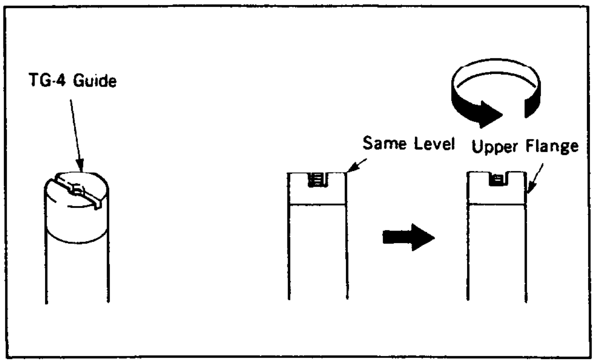


Fig. 53

No. 4 Guide (TG-4) Adjustment

1) Play back the tracking alignment tape.
2) In the FWD mode, check that the tape runs along a TG-4 lower flange. When there is a clearance, turn TG-4 counter-clockwise to put the tape along the TG-4 lower flange. turning angle must be within 180°.
When this is done, check that a tracking waveform (Fig. 54) is not changed.
When a tracking waveform inlet is downward as shown in Fig. 55, make tracking adjustment at the inlet side by raising a height of TG-4.

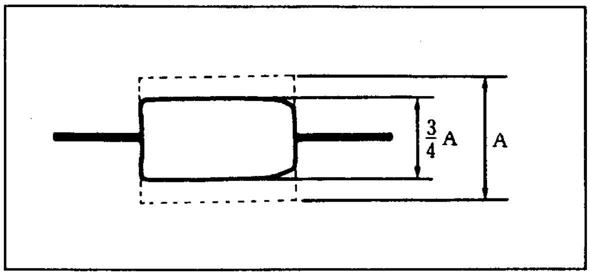


Fig. 54

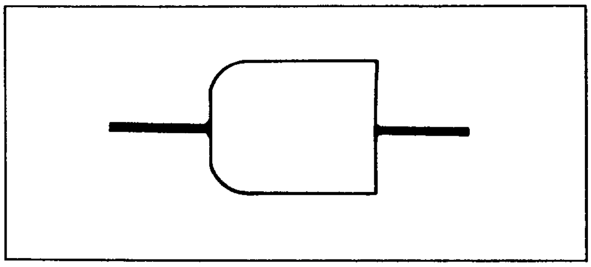


Fig. 55

Tape Path Adjustment for "Guide Rail Base 1 with TG4 Gate Adjustment" (Fig. 56)

After adjusting an inlet, when the TG-4 lower flange is curled in the REV mode, turn the TG-4 gate adjusting screw at pitches of 45° to the left to remove a curl. (A lock screw is attached to the TG-4 gate adjusting screw. First, loosen the lock screw a little, and then, turn the gate adjusting screw. After adjustment, tighten the lock screw.)
If the TG-4 gate adjusting screw is turned to the left too much, the TG-2 upper flange (arrow-indicated part in the figure above) is greatly curled. If it happens, turn the screw to the right.

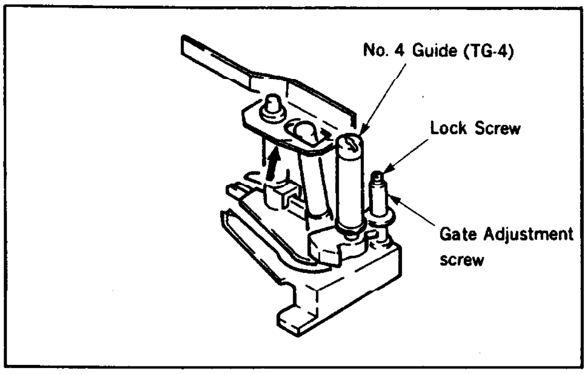


Fig. 56

4-4 NO. 11 GUIDE (TG-11) ADJUSTMENT

1) In the PLAY BACK mode, check that it has no deflection between the capstan and No. 11 guide (TG-11).
   (Criterion : 0.5mm or less)
   when the tape is deflected, turn the No. 11 guide (TG-11) to remove its deflection. (Fig. 57)
2) Select the REV mode and check the RF waveform at the outlet side. (Fig. 58)
3) If the waveform is defective, turn the TG-11 nut counterclockwise by 90° and recheck 2), 3) and 4).
4) Apply screw lock to the No. 11 guide (TG-11).

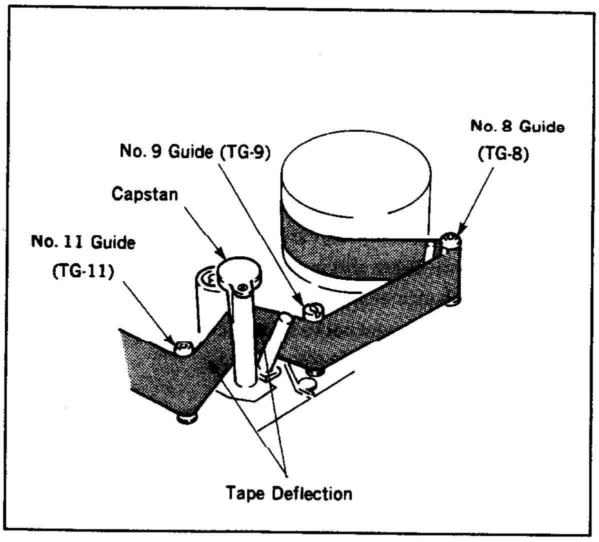

No. 8 Guide
(TG-8)
No. 9 Guide (TG-9)
Capstan
No. 11 Guide
(TG-11)
Tape Deflection

Fig. 57

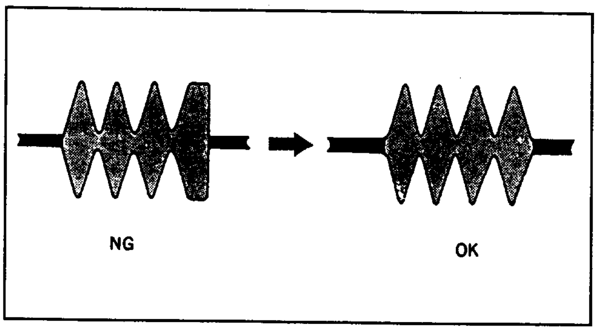


Fig. 58

4-5 CHECK AFTER ADJUSTMENT

1. Tracking Check

1) Play back the tracking alignment tape. In the PATH mode, shift a track. (Fig. 59)
2) At this time, check that a minimum amplitude value (E_{MIN}) is 67% or more of a maximum amplitude value (E_{MAX}). (Fig. 60)
3) Make sure that the waveform does not fluctuate greatly. (Fig. 61)

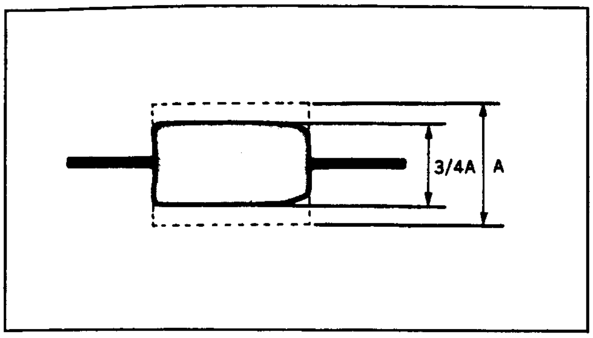


Fig. 59

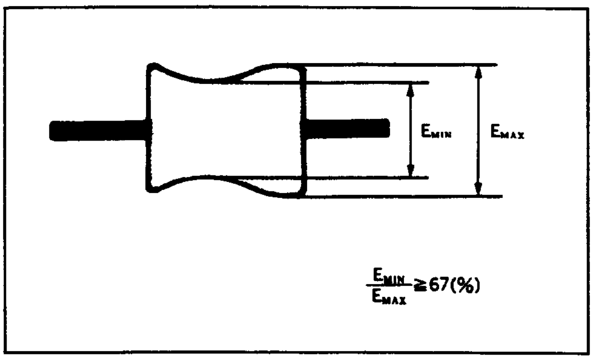


Fig. 60

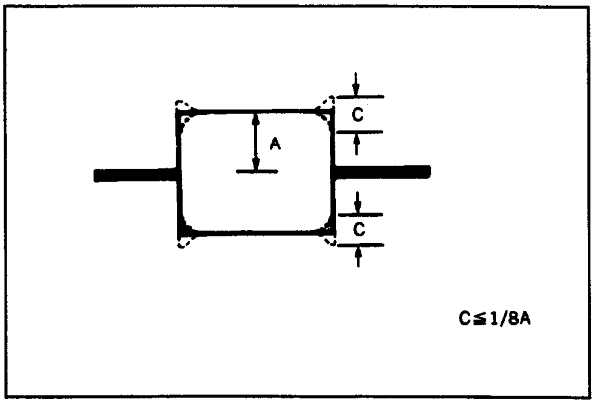


Fig. 61

2. CUE, REV Check

1) Play back the tracking alignment tape and select the $\boxed{\text{REV}}$ mode. At this time, waveform peak pitches must be unform. (Fig. 62 ⓐ) When they not uniform, make tracking adjustment in 4-2 and No. 11 guide (TG-11) adjustment in 4-4.
2) Select the $\boxed{\text{CUE}}$ mode. At this time waveform peak pitches must be uniform. (Fig. 62 ⓑ) When not uniform, make tracking adjustment in 4-2.

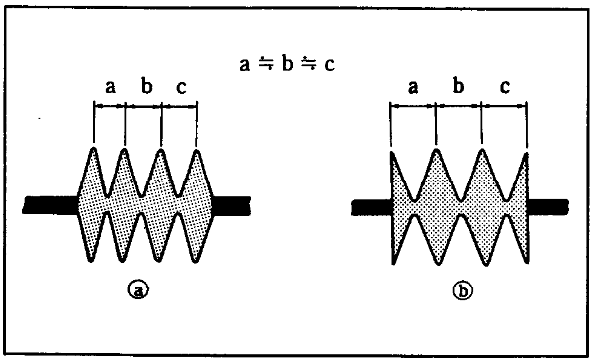


Fig. 62

3. Rise Check

1) Play back the tracking alignment tape.
2) In the PLAY BACK mode, check that the RF waveform rises horizontally within one second. At this time, check also that the tape is not deflected around the pinch roller. (Fig. 63)
3) Play back the tape after CUE/REV and FF/REW operation and check that the RF waveform rises horizontally within one second. At thistime, check also that the tape is not deflected around the pinch roller.
4) Repeat the checks in 2) and 3).

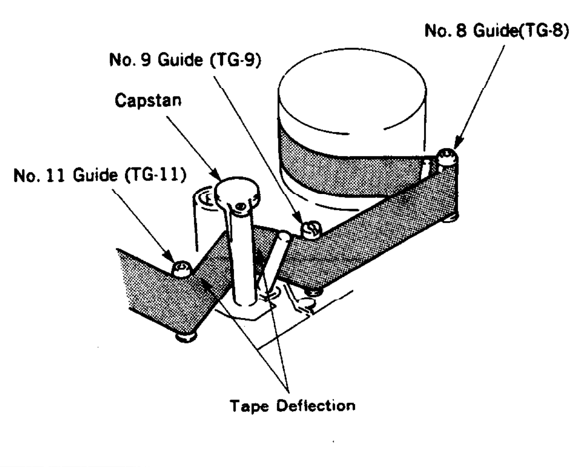

No. 8 Guide(TG-8)
No. 9 Guide (TG-9)
Capstan
No. 11 Guide (TG-11)
Tape Deflection

Fig. 63

4. Tape Running Check

In the CUE and REV modes, check that the TG-2 upper and lower flanges, TG-4 lower flange, TG-5 upper flange, TG-8 upper flange and TG-11 upper and lower flanges are not culed greatly. (Fig. 63)

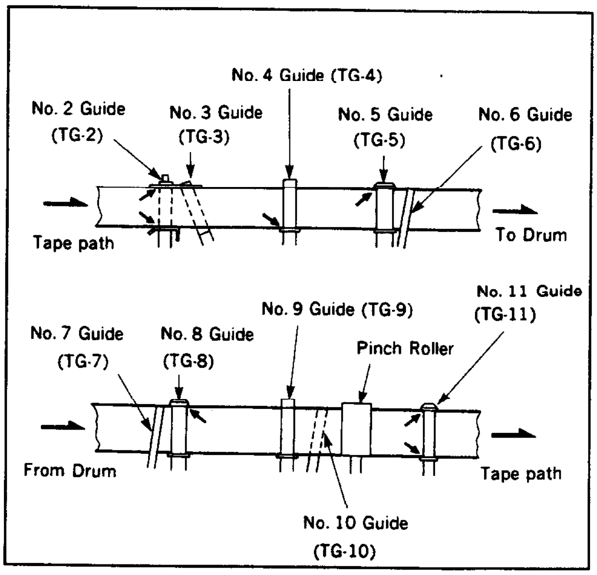
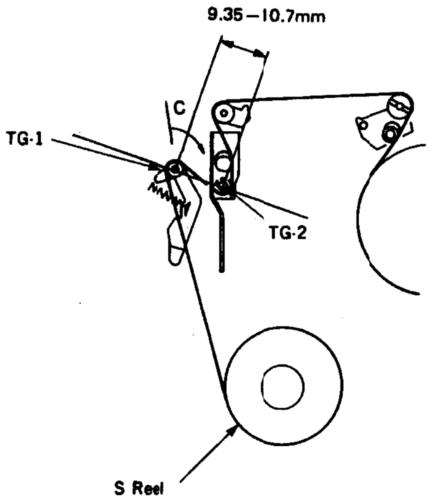
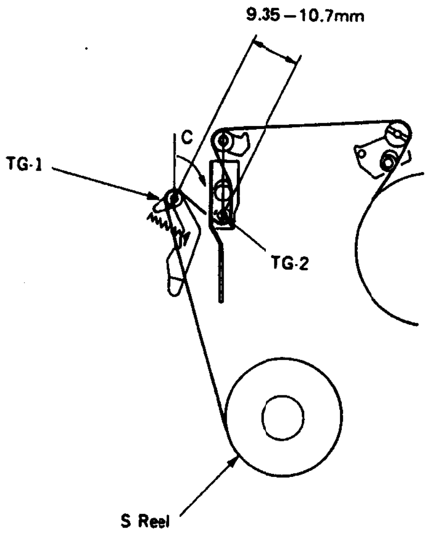

No. 4 Guide (TG-4)
No. 2 Guide (TG-2)
No. 3 Guide (TG-3)
No. 5 Guide (TG-5)
No. 6 Guide (TG-6)
Tape path
To Drum
No. 11 Guide (TG-11)
No. 9 Guide (TG-9)
No. 7 Guide (TG-7)
No. 8 Guide (TG-8)
Pinch Roller
From Drum
Tape path
No. 10 Guide (TG-10)

Fig. 64

Correction Table

As there is an error on page 40, please correct it.

Incorrect	Correct
 9.35 – 10.7mm C TG-1 TG-2 S Reel	 9.35 – 10.7mm C TG-1 TG-2 S Reel